The Only Journal With a Paid Circulation in the Rock Products Industry

Rock Products

Vol. XXIV, No. 20 CHICAGO September 24, 1921

EDITORIAL DEPARTMENT—

Nathan C. Rockwood, Editor
Chas. A. Breskin, Associate Editor

ADVERTISING STAFF—

Charles H. Fuller, Eastern Manager, 101 West 41st Street, New York City

A. S. Barnett,
Western Representative

SUBSCRIPTION—Two dollars a year to U. S. and Possessions. Three dollars a year to Canada and foreign countries. Twenty-five cents for single copies.

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ROCK PRODUCTS—

Geo. P. Miller, Manager
E. M. Gibson, Assistant Manager

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W. D. Callender, President.
N. C. Rockwood, Vice-President.
Geo. P. Miller, Treasurer.
C. O. Nelson, Secretary.

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This Griplock feature locks the links together so securely that they form a chain before the pins are inserted

Rex Griplock Chain is made for practically every transmission and conveyor need. You can secure it either from distributors or direct. Send today for a sample link

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The "Certified Malleable" links of Rex Griplock are so strongly locked with each other that they form a powerful chain without the link pins. Then the pins are put in to further fortify the union.

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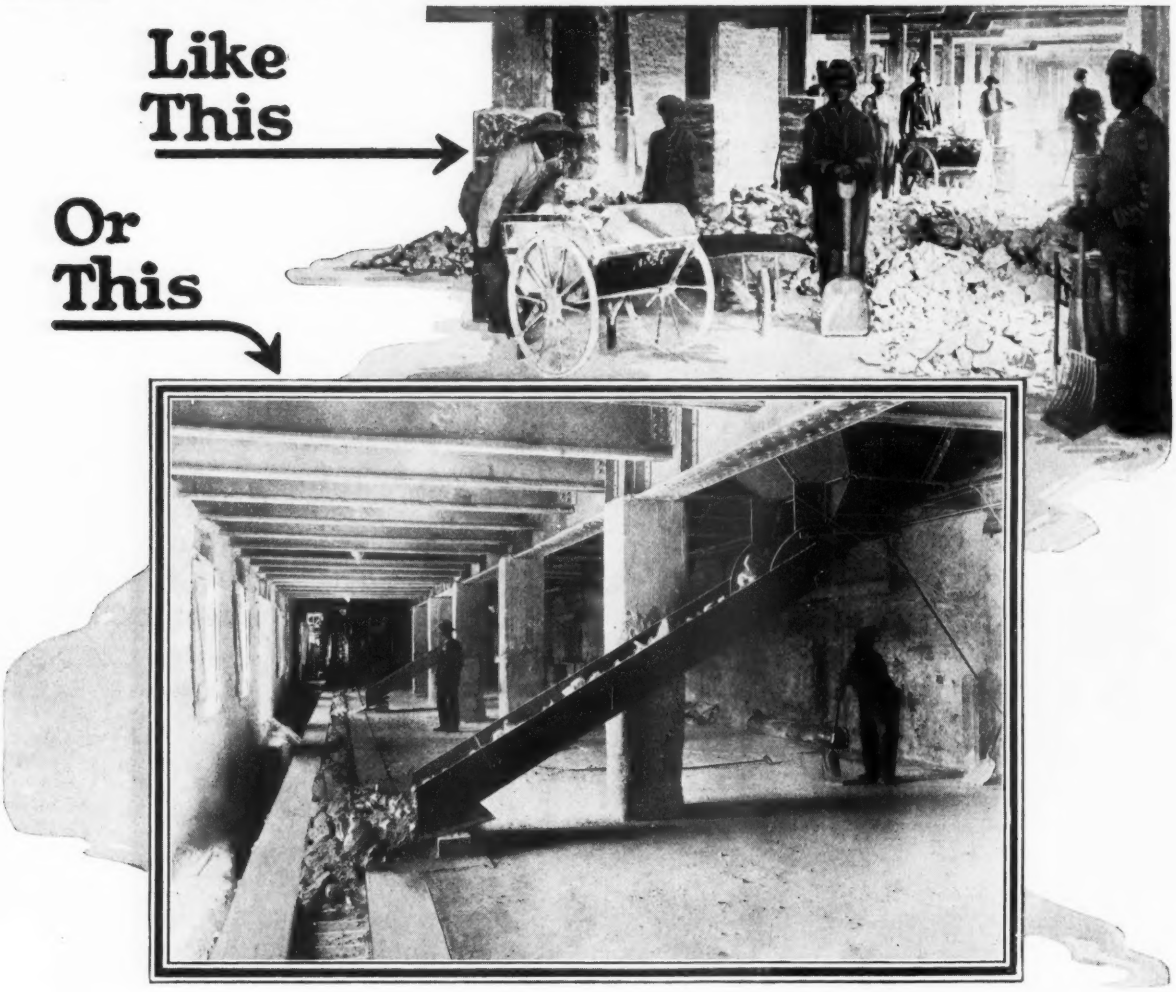
Branch Offices and Representatives in Principal Cities in the United States and Abroad

Rex Traveling Water Screens, Rex Concrete Mixers and Pavers, Rex Sprockets, Rex Elevators and Conveyors

How Do You Handle Lime?

Like This →

Or This →



ABOVE—the old-fashioned system of drawing the kilns by hand, piling the lime on the floor, and carting to crushers or cars in wheelbarrows.

Below—the modern and up-to-date Link-Belt method (part of our equipment furnished the Riverton Lime Co., Riverton, Va.), where the lime is handled by machinery from the kilns to overhead storage bins, and thence to shaker screen, which delivers to crusher, box car loader, or barrows, all with a minimum of labor, expense and increased output.

Lime is not difficult to handle by machinery. The intermittent service of the conveyors and the slow speed at which they run make for long life and low maintenance cost.

We have brought many old-fashioned plants up to date at a minimum of cost, and would welcome the opportunity of talking this matter over with you.

Send for our new 80-page book No. 416. It contains facts and figures on the mechanical handling of stone and lime.

Link-Belt Company, Chicago, 329 W. 39th St.; Philadelphia, Hunting Park Ave. and P. & R. Ry.

619

LINK-BELT

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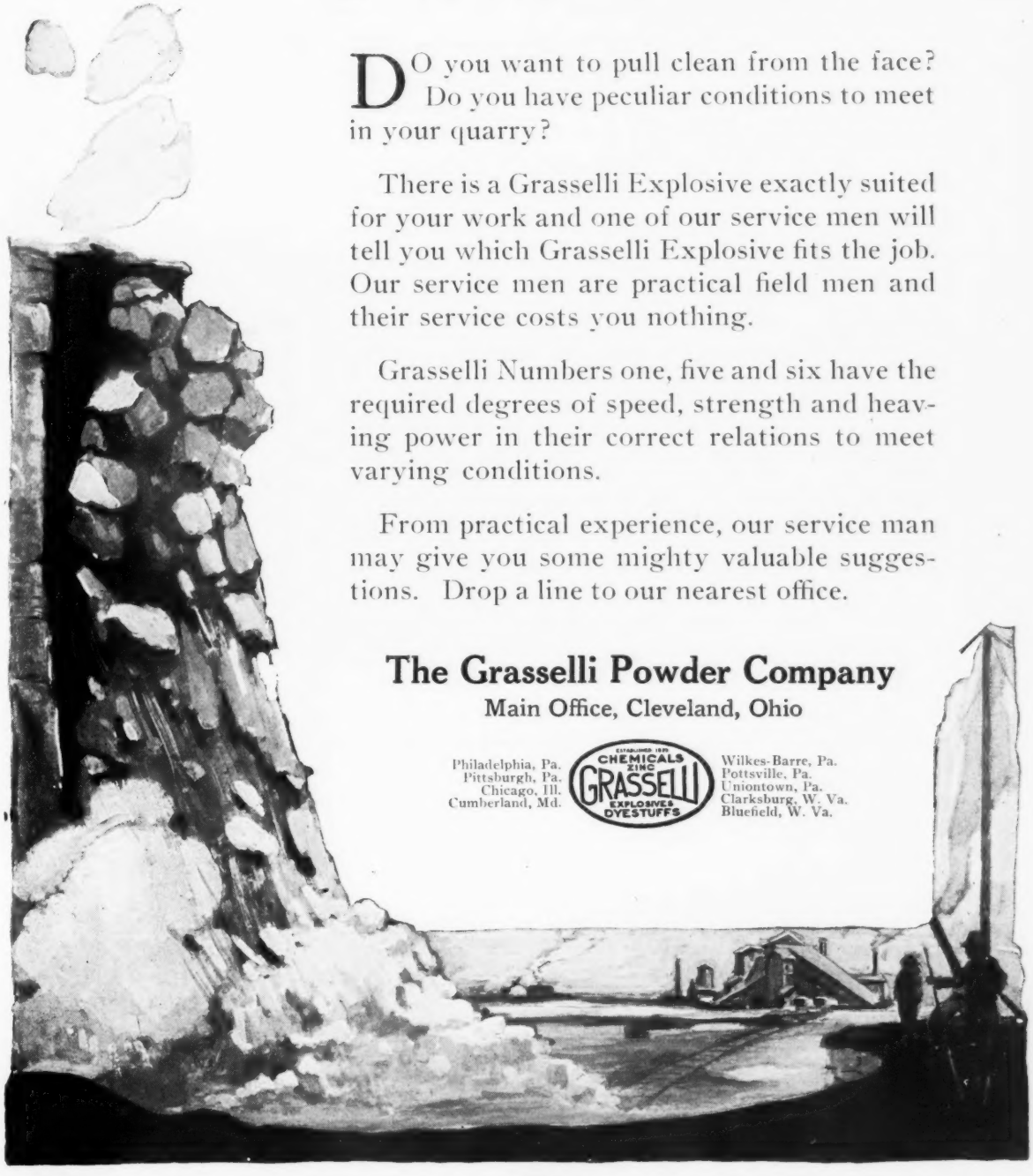

DO you want to pull clean from the face? Do you have peculiar conditions to meet in your quarry?

There is a Grasselli Explosive exactly suited for your work and one of our service men will tell you which Grasselli Explosive fits the job. Our service men are practical field men and their service costs you nothing.

Grasselli Numbers one, five and six have the required degrees of speed, strength and heaving power in their correct relations to meet varying conditions.

From practical experience, our service man may give you some mighty valuable suggestions. Drop a line to our nearest office.

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Shipment from Stock at Reduced Prices

Contractors, Building Supply Dealers, Industrial Plants and other concerns who load Sand, Gravel, Crushed Stone, Coal, Coke, Cinders and other loose materials from ground storage, will profit by installing a

JEFFREY RADIAL LOADER

As a typical example of the savings effected by these loaders, The Continental Clay Company of Columbus, Ohio, in a test made recently at their plant, loaded a 5-ton truck with sand in 5 minutes at a cost of 8 cents per ton. To load the same amount by hand required 4 men 25 minutes at a cost of 50 cents per ton.

Can you afford to delay the purchase of a machine which will save 42 cents per ton, and pay for itself in a few months?

Write today for Catalogs and Prices, or a Jeffrey representative to call on you with full particulars.

The Jeffrey Mfg. Co., Columbus, Ohio

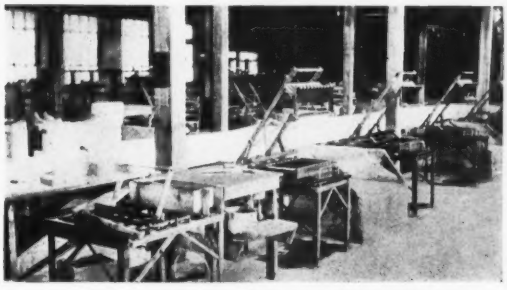
New York Buffalo Denver Montreal Detroit
Boston Birmingham Cleveland Chicago St. Louis
Scranton Philadelphia Pittsburgh Los Angeles Dallas
Middlesboro, Ky. Milwaukee Charleston, W. Va.

SHOPE BULLETIN

VOL. I September 24, 1921 Number 2

More than a million a month NOW!

The Office of the Company



The Inside of the Plant

The Wisconsin Shope Brick Co., of Milwaukee, Wis., started making Shope Concrete Bricks during January, 1921, and during the past six months have delivered upwards of six million bricks.

Doing quite well when you consider Milwaukee is situated in the heart of the clay brick industry. But then, they have a superior product and of course, a monopoly in their selling territory, all of which makes price-cutting unnecessary, and the permanent, beautiful and absolutely waterproof face of these bricks is creating an insistent demand for them.

If you have a sand and gravel plant, crushed stone screenings, or a slag pile you would like to market, think of the two hundred million dollars that will be spent for brick annually during the next few years, and then write to us.

We have the machinery, the patented process and give territorial allotments only.

Watch Us Grow—Keep Your Eye on This Page Every Issue

Here are two more added to the list of live ones

CENTRAL WISCONSIN CONCRETE PRODUCTS CO.
STEVENS POINT, WIS.

WALLA WALLA SHOPE BRICK CO.
C. A. Holbrook, Mgr. WALLA, WALLA, WASH.

HERE IS THE LIST OF LIVE ONES

The Miles Co. ..... Salem, Ore.
Eugene Concrete Co. ..... Eugene, Ore.
Wastenburg Brick Co. ..... Klamath Falls, Ore.
Arizona Shope Concrete Brick Co. ..... Phoenix, Ariz.
W. B. Coarsey ..... Tampa, Fla.
Texas Shope Brick Co. ..... 3056 Sumpter Bldg., Dallas, Tex.
Birmingham Slag Co. ..... Birmingham, Ala.
Shope Brick Co. of Wisconsin ..... 50th and Lake Sts., Milwaukee, Wis.
Dark Canyon Stone Co. ..... H. W. Jones, Mgr., Rapid City, S. D.
The Polychrome Cement Brick & Tile Co. ..... Carter-Cotton Bldg., Vancouver, B. C.
Warren Sand & Gravel Co. ..... Easton, Pa.
Penn Shope Brick Co. ..... Reading, Pa.
Lycoming Shope Brick Co. ..... Williamsport, Pa.
Shope Brick Co. ..... Portland, Ore.
Rustic Brick & Supply Co. ..... Palette Rd., Ford City, Ont., Can.
Puyallup Shope Brick Co. ..... Puyallup, Wash.
Utah Shope Brick Co. ..... P. O. Box 632, Salt Lake City, Utah
Decoration Brick Co. ..... 1565 N. Lake Ave., Seattle, Wash.

Shope Brick Company

361 East Morrison Street Portland, Oregon

Another Installation of the TRAYLOR "Bulldog"

The primary crusher of the new Reliance plant of the Giant Portland Cement Co., at Egypt, Penna., was furnished by the Traylor Engineering and Manufacturing Co.—it's a 48x60-in. "Bulldog" Jaw Crusher.

The use of a jaw crusher is unusual in this district, because the material has a tendency to sliver in a jaw crusher, but the Traylor Company easily overcame this objection by the attachment of a special slab breaker to the stationary jaw, and the use of this large jaw crusher makes possible the use of 100-ton steam shovels and the resulting operating economies.

It has become a habit of the "Bulldogs," both jaw and gyratory, to successfully meet the unusual conditions that frequently confront construction engineers and quarry operators.

Traylor Engineering & Manufacturing Co.

Main Offices and Plant: ALLENTOWN, Pa.

NEW YORK	PITTSBURGH	CHICAGO	LOS ANGELES	SPOKANE
30 Church St.	211 Fulton Bldg.	1414 Fisher Bldg.	Citizens Bank Bldg.	Mohawk Block

Truck and Tractor Division: Cornwells, Bucks Co., Pa.

General view of the cement plant and new crushing plant and bins

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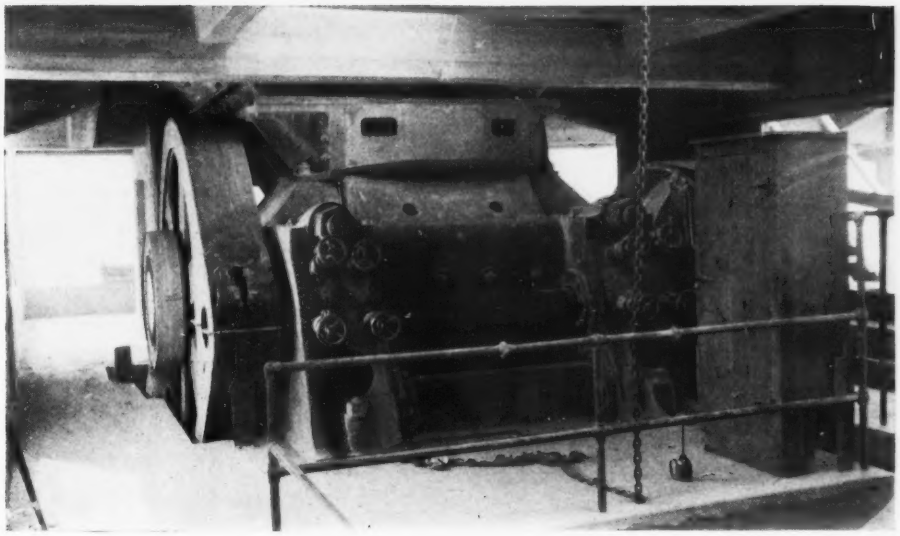
Fairmount Crusher



36″ x 60″ Fairmount type crusher. Southwestern P. C. Co., El Paso, Texas, Plant

The "Allis-Chalmers Fairmount Type Crusher" installed at the El Paso plant on the recommendation of Allis-Chalmers Engineers, is giving thorough satisfaction. This crusher, altho designed to take material up to 24 in. thickness, has been put to some service tests, as evidenced by the following report:

"We had a rock in the quarry yesterday approximately 5 ft. long, 3½ ft. wide and 2½ ft. thick. This came along when we were crushing 55 tons in 6¼ minutes and it evidently did not delay the operation very much, as it was crushed and gone before the next car could be brought into place."

This cement company has a similar size crusher operating in their plant at Victorville, Cal.

Competent Engineers at your service.

Write for Bulletin No. 1456-A

ALLIS-CHALMERS MANUFACTURING CO.
MILWAUKEE, WIS. U.S.A.

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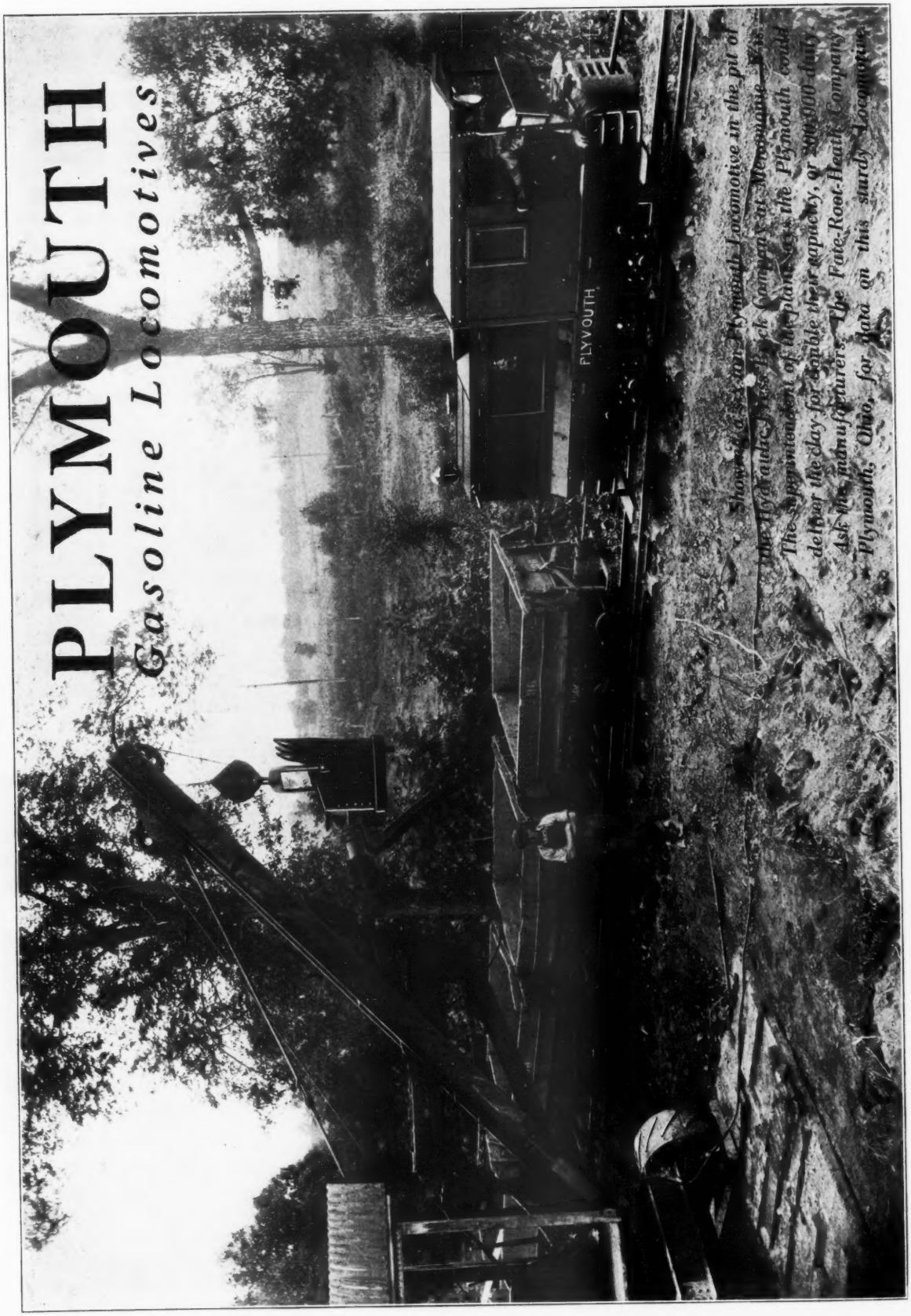

PLYMOUTH
Gasoline Locomotives
PLYMOUTH
Shows a 25-ton Plymouth Locomotive in the pit of the Hydraulic Press Brick Company's at Menominee, Wis.
The superintendent of the plant says the Plymouth could deliver the clay for double their capacity, or 200,000 daily.
Ask the manufacturers. The Fate-Root-Heath Company, Plymouth, Ohio, for data on this sturdy Locomotive.

When writing advertisers please mention ROCK PRODUCTS

Rock Products

Vol. XXIV Chicago, September 24, 1921 No. 20

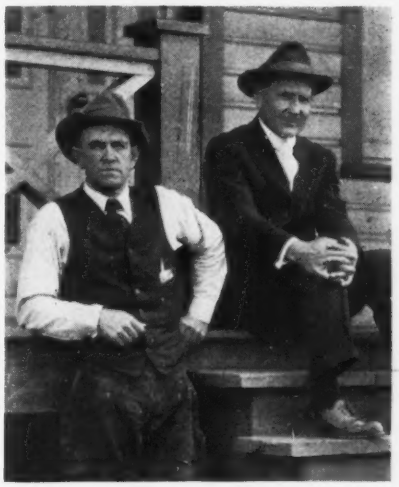
New Tennessee Phosphate Plant

Mining, Washing and Drying Operations at New Plant of the International Agricultural Corporation at Wales, Tennessee—Many New and Improved Devices

Looking down toward phosphate beds. Note dragline operation

ONE of the newest and most improved phosphate plants to appear in the Tennessee phosphate district is that of the International Agricultural Corporation at Wales. The plant which is one of the largest in the region was designed and built by the company and contains many new and improved devices to facilitate economical and efficient manufacture of phosphate rock in its various forms. The International Agricultural Corporation is one of the largest producers of phosphate rock in the district and the methods employed by this company to mine, wash and dry the phosphate rock is somewhat different from that of the other phosphate producers in that section.

The deposit at Wales is in close proximity to the plant and two systems of mining are followed—hydraulic and dragline. The remote deposits are stripped with No. 14 Bucyrus caterpillar type draglines and mined with No. 36 Marion caterpillar draglines. The overburden consists of a red sandy clay which is anywhere from 4 to 20 ft. deep. The phosphate rock is loaded into 4 cu. yd. 36 in. gauge side-dump cars and hauled by an 18-ton steam locomotive to the plant. An incline similar to that found in the ordinary gravel or stone crushing plant is used to elevate the cars to the tipple, where the material is washed out of the cars by a stream of water after the cars have been side dumped. One of the accompanying photographs illustrates the hoist used to pull the cars up the incline, which in this case is of the Flory type with a 4,000 lb. rope pull. It is electrically operated by a 25 h. p. motor. The material in the feed hopper is washed down to a set of log washers by a monitor located in the feed hopper.



A. F. Clagett, superintendent, and Jas. A. Barr, engineer

Washing plant and incline

Hydraulic Excavation

The deposits in close proximity to the plants are stripped with either dragline or hydraulic methods. After stripping, the material is excavated by a monitor with water under 150 lb. pressure and flows to a sump, where it is picked up by pump and elevated to the washing plant. This method of mining is similar to the methods used in hydraulic mining of Florida soft phosphate, which has been explained in previous issues of Rock Products. An 8-in. centrifugal mine pump direct connected to a 100 h. p. slip-ring motor is used to elevate the material to the dewatering screen, the under-size going to the sand department and the over-size to the log washers.

Washing

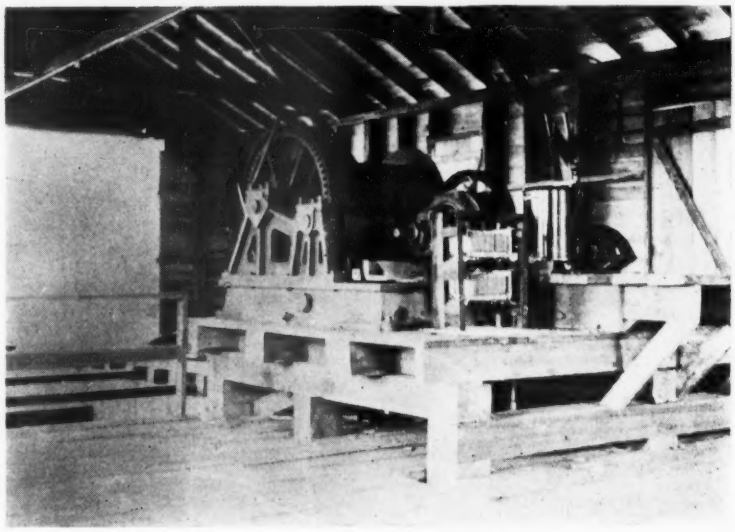
The log washer consists of a rectangular box in which two long shafts with a series of blades are rotated. This is similar to what is known as a "pug mill." The action of the blades is to knock the clay and other foreign matter loose from the larger material and to thoroughly mix the water and phosphate sand. Fresh water is constantly being added to the log washer. The double log washer is 25 ft. long and is set on a pitch of 1 in. to the foot.

On leaving the log washer the material goes to a rinsing screen 20 ft. long and in the shape of a truncated cone, being 3 ft. at one end and 5 ft. at the other, with ⅛ in. slots over the entire surface. This screen separates the material into rock and fine material, and here a second washing is also made. The rejections from the screen are sent to a mud picker's belt, 30 in. wide, 25 ft. centers, running at 50 ft. per min. On this belt, all the flint, limers or mud balls are removed by hand, while the good material is deposited into a large ground pile for drainage.

Sand Reclamation

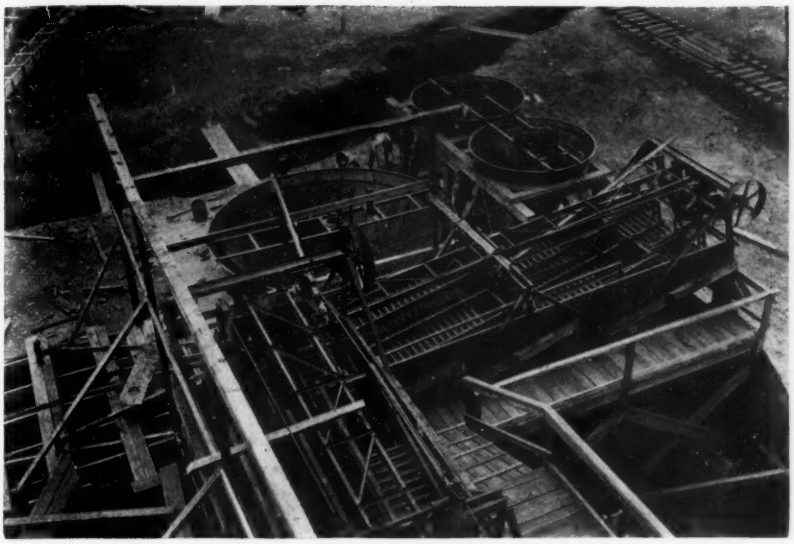
The sand and dirty water passing the ⅛ in. slots in the screen combines with the undersize material from the hydraulic screen, all going direct to the 14 ft. diameter, 12 ft. high cypress tanks. The overflow from these tanks goes to the fine sand department, while the material which settles at the bottom of the tank is elevated by means of hydraulic jets to an 8 ft. triple deck duplex Dorr classifier. The fine sand goes over from the tanks into a spillway cut several inches below the side of the tank.

As the material goes to the triple deck classifier, fresh water is added and here again the finer sands go over a spillway to the fine sand department, while the dewatered material goes to another triple deck classifier for further cleansing. Fresh water is again added to the second classifier, which also overflows to the fine sand department, while the dewatered material goes to the ground storage piles for drainage. This constitutes what is known as the coarse sand department. The spillways from the cypress tanks and



Electric hoist for hauling cars up incline

Tanks for sand settling



Top view showing Allen cones and Dorr classifiers

classifiers all combine to an 80 ft. diameter Dorr thickener, located within a concrete tank. (This is shown in one of the accompanying photographs.) Here the material is thoroughly cleansed, the overflow going over a spillway to the waste or mud pond. The settled material is picked up by three Dorr diaphragm pumps, with a combined capacity of 15 tons of solids per hour, which discharge into a 16 ft. Allen sand washing cone that not only cleanses but reclaims extremely fine material that would otherwise be lost.

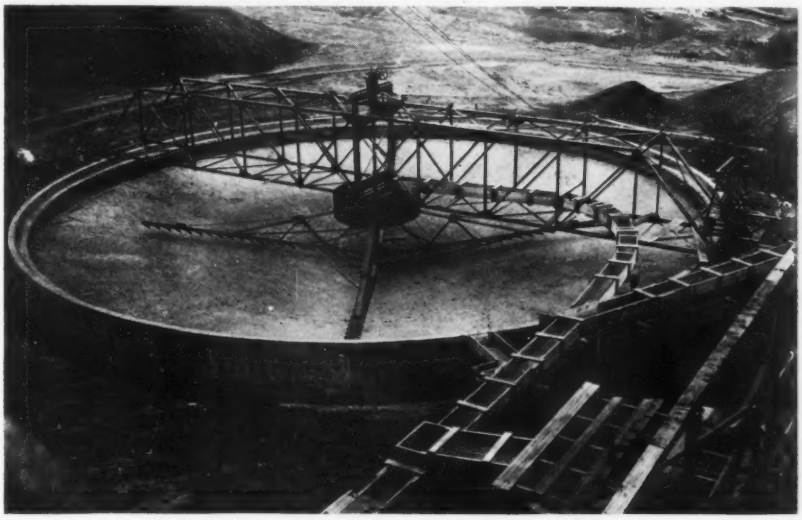
It is interesting to note that the "brown rock" fields of Tennessee contain a large amount of valuable material in the form of fine phosphate sands. In some cases as much as from 60 to 80 per cent of the material is mined in this form. Much of this sand is very fine, even 200 mesh, and its recovery, which includes its separation from sticky, brown, collodial clays has always been one of the main problems of the industry.

This problem has only been solved within the last two years, and at this plant the solution appears to have been found through the use of the Allen cone which, at this plant at least, has remedied the losses encountered by the escape of these fine sands in the waste waters.

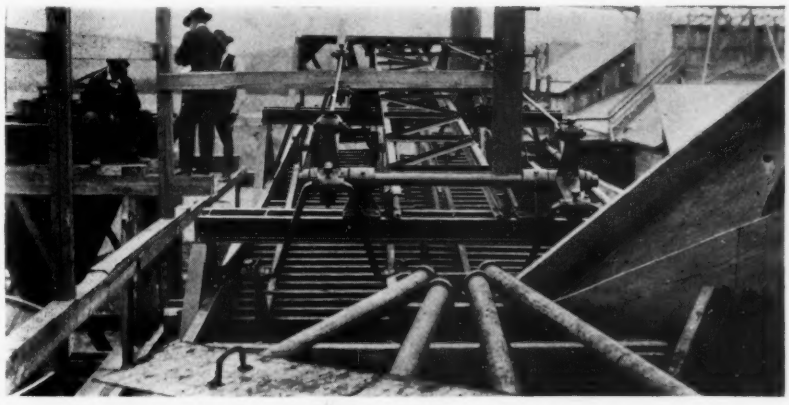
Sand-Washing Cone

The distinguishing feature of the sand-washing cone is the automatic control of the valve which admits the settled sand to the washing chamber located in the apex of the cone. This control is actuated by a submerged float that rises and falls with changes in diversity of the liquid mass in the cone. The control of this valve allows the settled sand to fall by its own weight into the hydraulic or washing chamber without permitting clear water to escape in the main cone except in very small amounts.

The sand settling into the washing chamber is elevated by a hydraulic jet and delivered to two 8-ft. Allen dewatering cones. The admission of the hydraulic water into the washing chamber is so regulated that the overflow from the 8-ft. dewatering cones is barely tinged with clay.



Dorr thickener, showing spillways to waste pond



Dorr classifiers

The overflow from the dewatering cones goes to the waste or mud pond, while the dewatered material is delivered to ground storage piles for drainage.

A 25-ton locomotive crane with a 1½ cu. yd. grab bucket is used to reclaim the material in the ground storage piles, which are located between the washing and drying buildings. The nominal ground storage is in the neighborhood of from 3,000 to 5,000 tons. The material in the ground storage piles consists of sands from the fine and coarse sand departments and this is taken, mixed together and deposited by the locomotive crane to the feed hopper for the dryer. The relation between dryer and washer buildings and the ground storage is shown in one

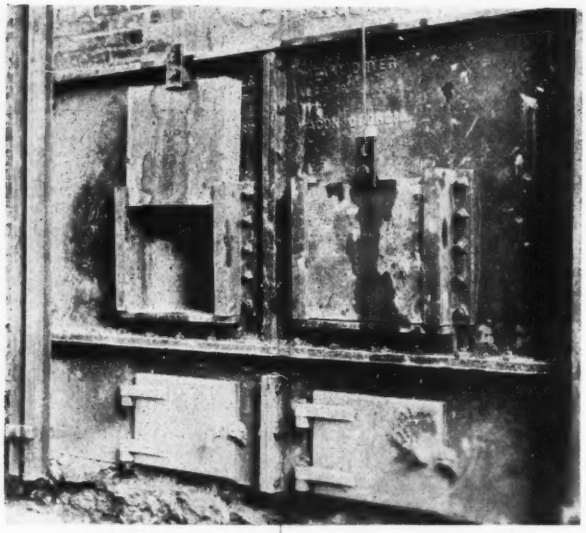
Mud pickers belt

of the accompanying drawings.

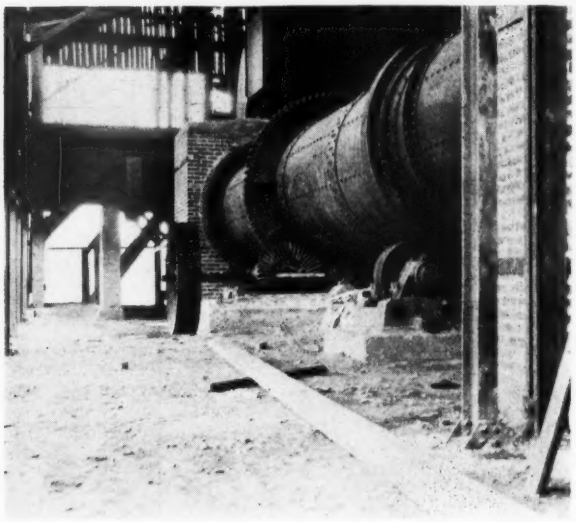
Drying

The material from the dryer feed hoppers falls onto shaker feeders depositing into two 66 in. x 40 ft. rotary dryers of special design and manufacture. These dryers were built to the company's own specifications and are of the extra heavy type, with direct fired furnace. An undergrate blast is furnished to the dryers by a No. 4 fan, furnishing 12,000 cu. ft. of air per minute, at 1½ in. static pressure.

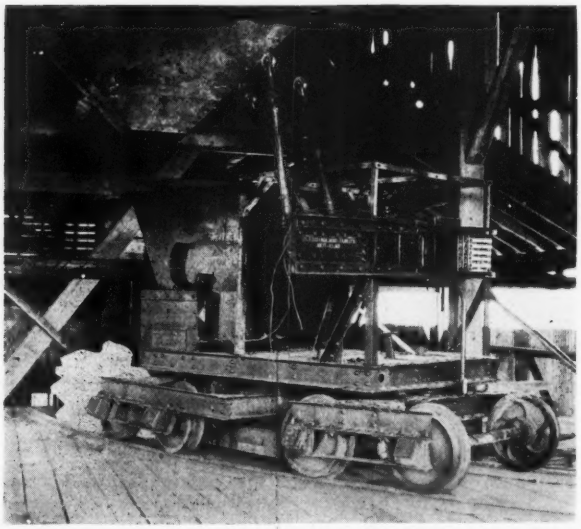
Both dryers discharge into a 7x12 in. bucket elevator of 42 ft. centers, the elevator being entirely enclosed within a steel casing. This elevator discharges to a steel storage bin of 15 tons capacity. From here the material is drawn direct to cars for shipping or else it is drawn off into a specially built 2-ton end-dump electrically-driven car which delivers to



Furnace for rotary dryer

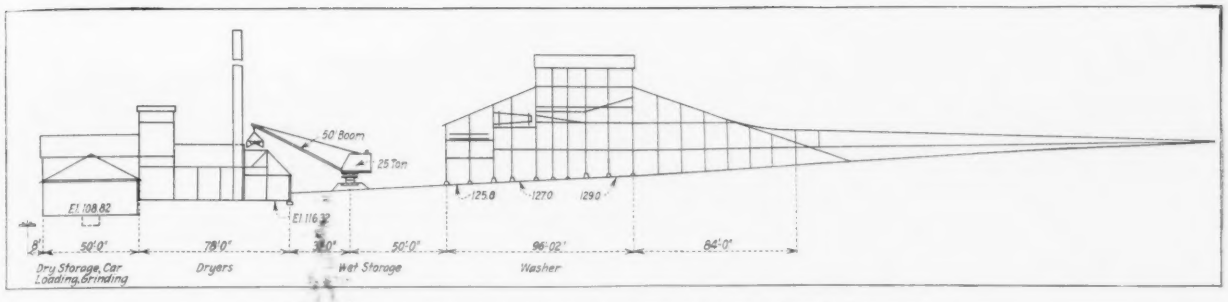


Rotary dryer



Specially built electric cars distributing phosphate to storage

Storage building under construction. Note reclaiming tunnel

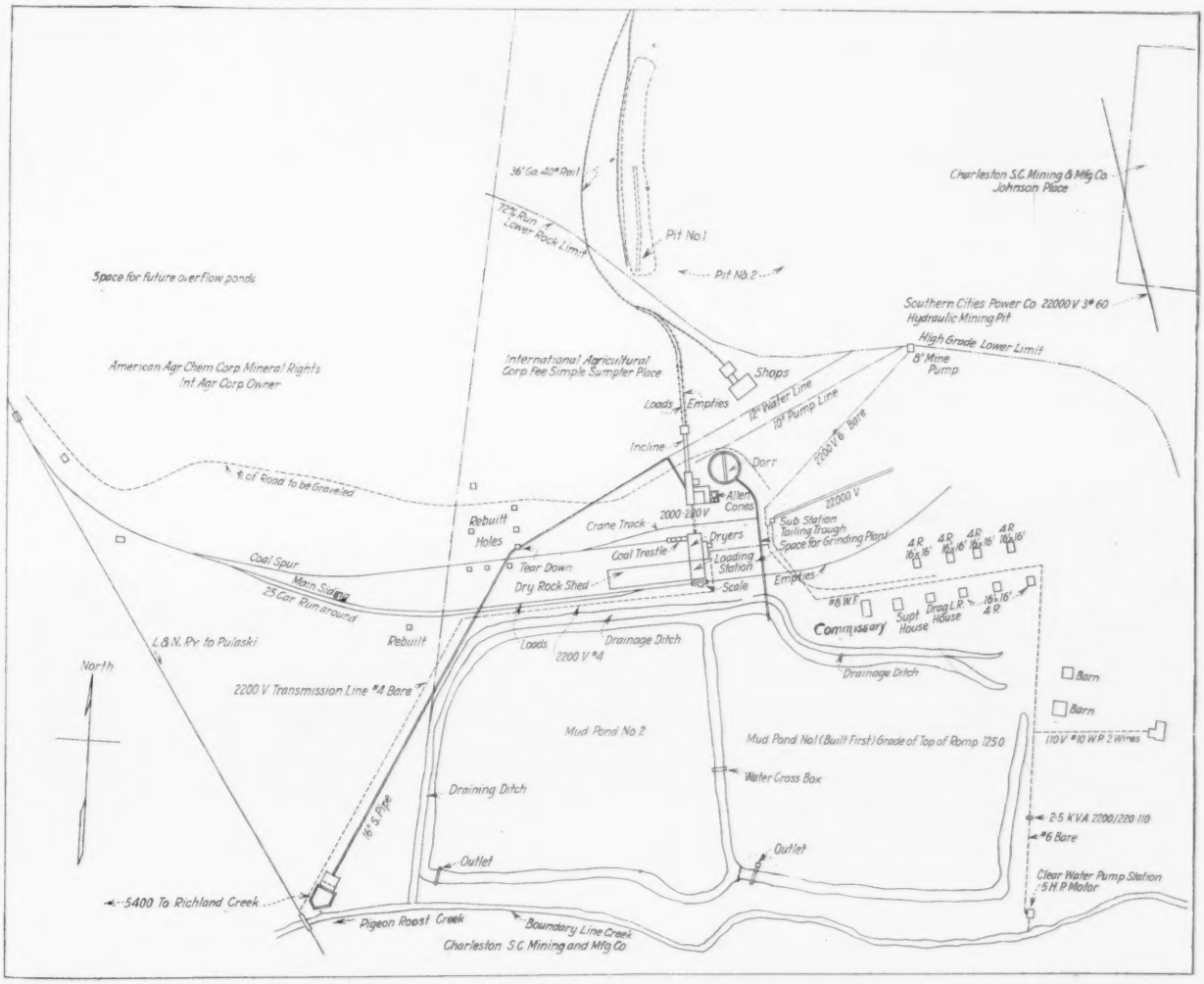


General side elevation of plant, International Agricultural Corporation

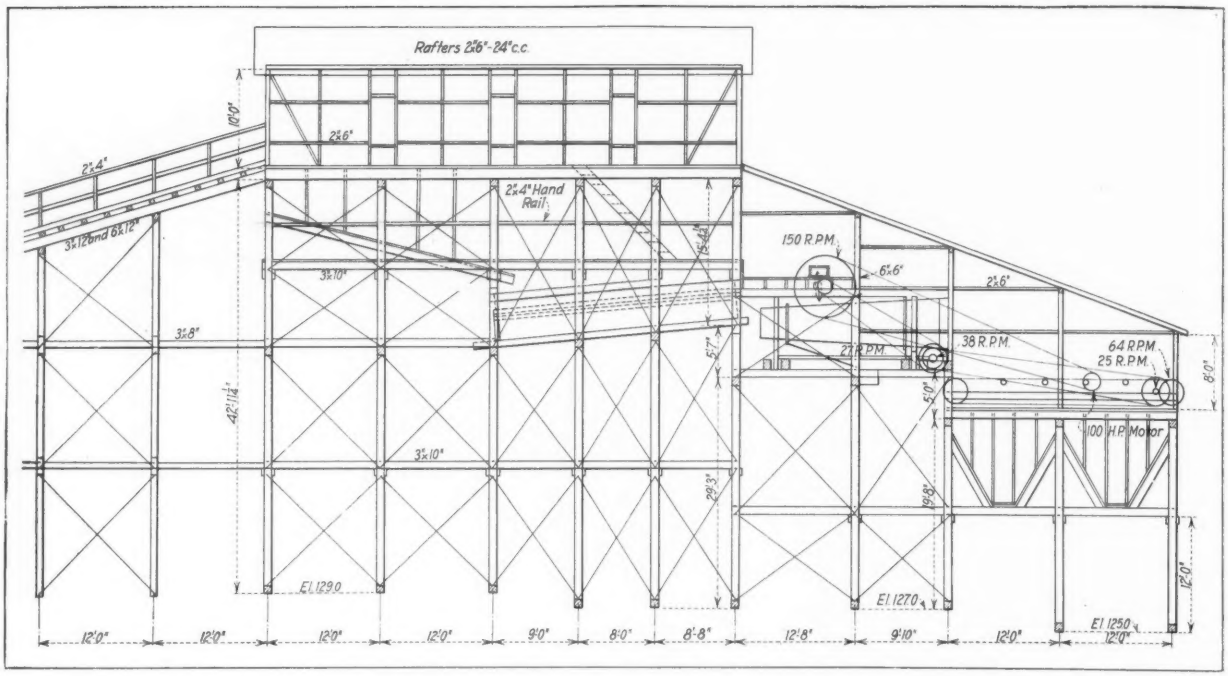
storage. This car is of the 8-wheel type, standard gauge, four wheels to each truck and is operated by a 5 h. p., 3-phase, 220 V. motor. The car runs overhead to the dry storage building, which is capable of storing at least 5,000 tons of dried phosphate sand.

As the material is needed from the dry storage building it is reclaimed by a belt conveyor running in a tunnel underneath the shed. The belt conveyor is 24 in. wide, 250 ft. centers and deposits the material onto a cross conveyor of 30 ft. centers, which delivers to a portable 16 in. box car loader, delivering directly to the car which sets on a track scale of the registering beam type. The cross conveyor also serves the shipping bin previously mentioned.

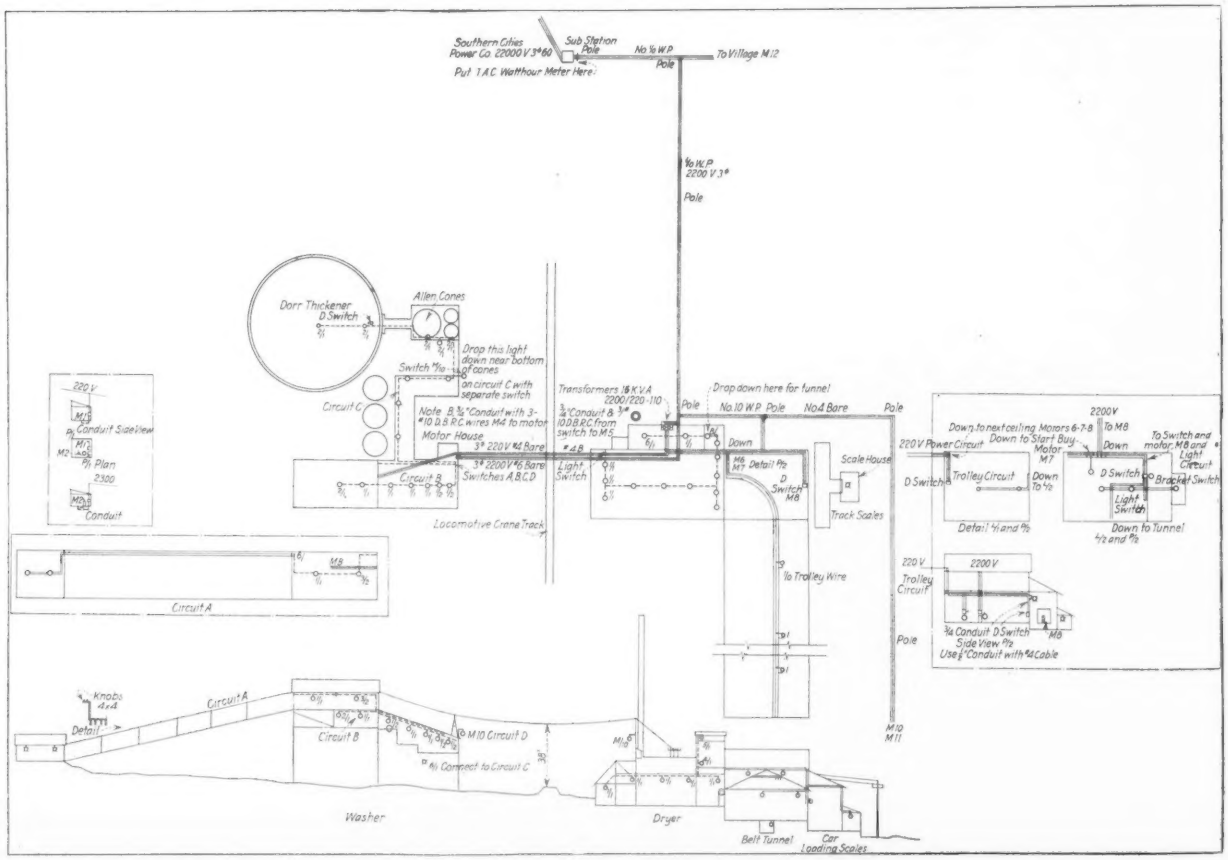
The flue gases and smoke from the two rotary dryers go to a breech and into an 18x18x48 ft. dust chamber. From here it goes on to a 5x135 ft. self supporting steel smoke stack. The material or dust in the dust chamber that settles is drawn out by a drag conveyor located in a tunnel underneath the dust chamber. In



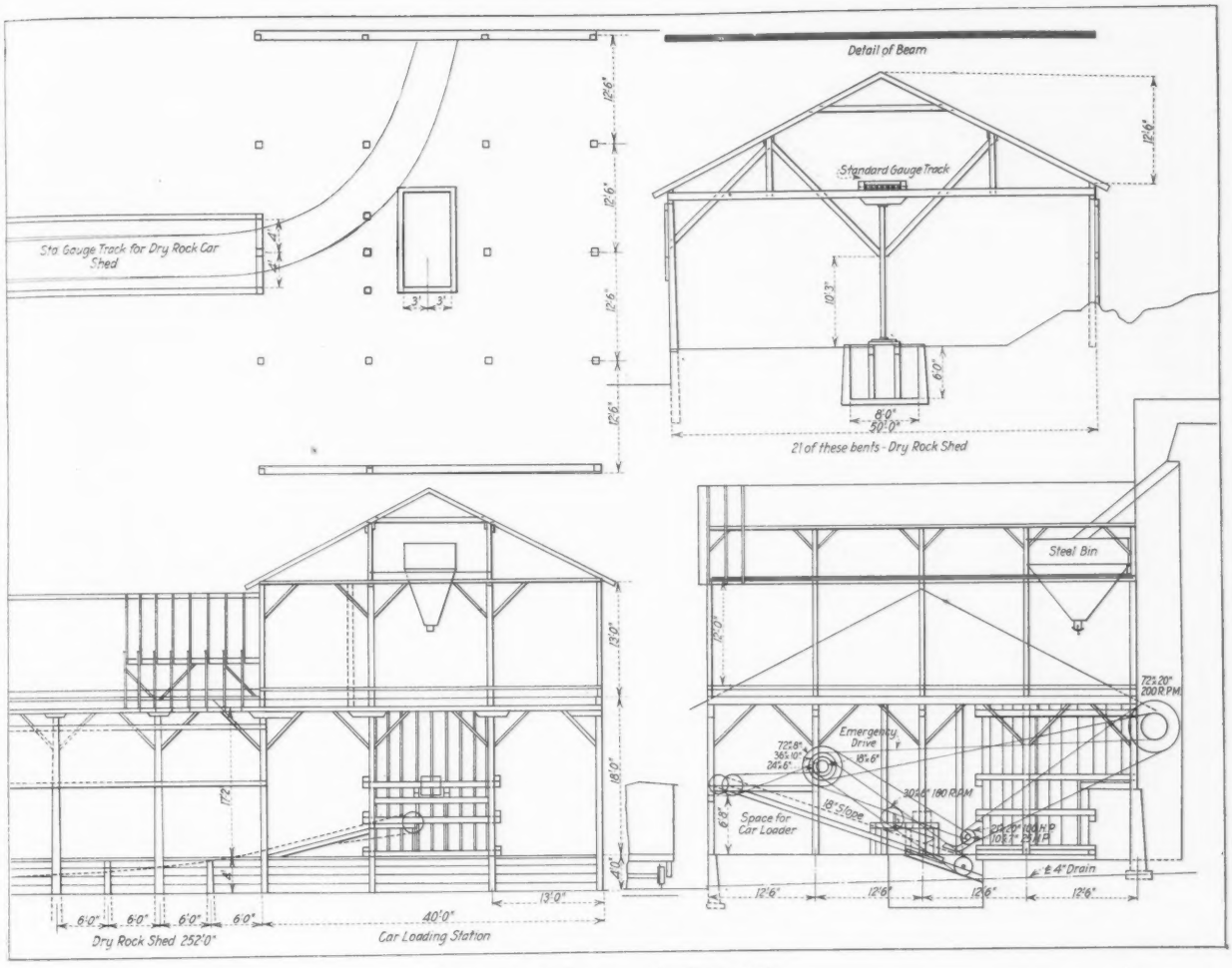
General plan—New Wales plant, International Agricultural Corporation



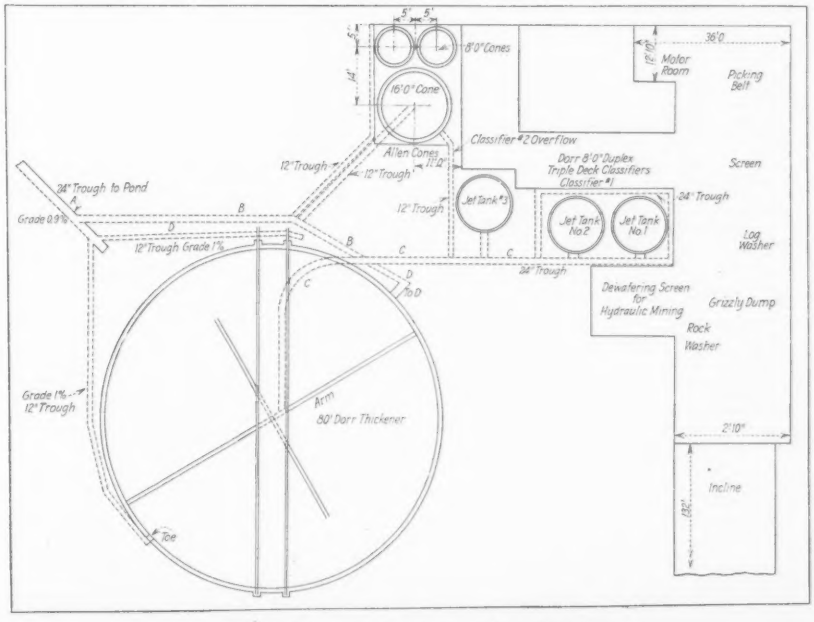
Details of washer, International Agricultural Corporation



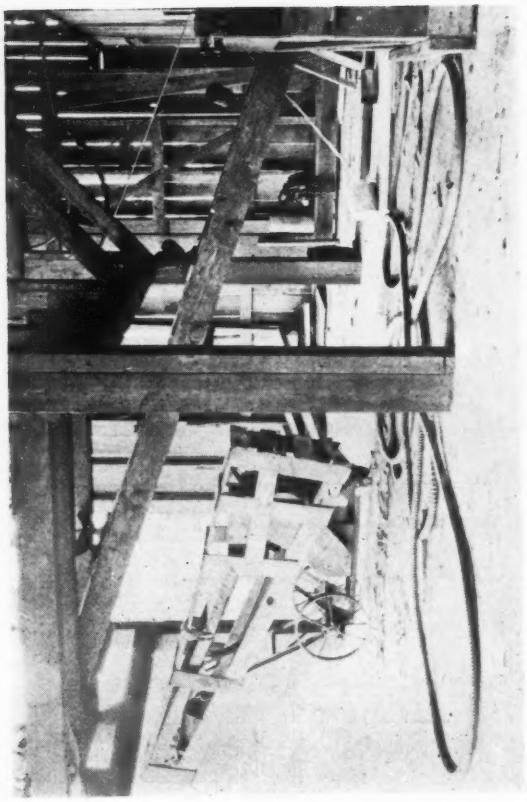
Wiring diagram and electrical details



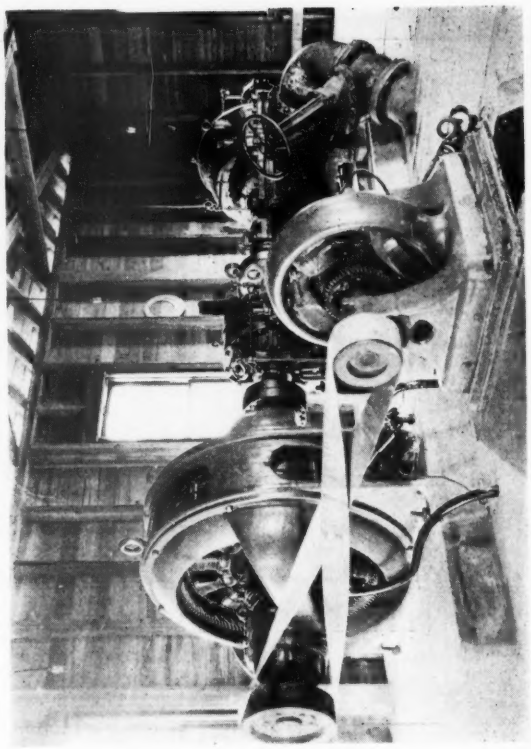
Dry rock shed and car-loading station



General layout of sand washing department



Box car loader



Exciter for motor and pumping unit

Reclaiming belt conveyor from storage

Pump connected to motor through turbo-gear

re.ity, this is the extremely fine phosphate sand, that otherwise would have been lost in the smoke stack. This fine material is delivered to a 4x6 in. bucket elevator of 42 ft. centers depositing into the shipping bin or to a projected grinding plant. The grinding plant has not been installed as yet, but it will be built to grind the especially fine material only.

Pumping Station

The equipment in the pumping station consists of two 10 in. two stage centrifugal pumps. As can be seen from the accompanying photograph, one of the pumps is connected through a Poole turbo-gear to a 350 h.p. synchronous motor, running on 3 phase, 60 cycle A. C. current. The other pump is direct connected to a 350 h.p. squirrel cage motor running at 1,800 R.P.M. The slip ring motor is excited by a 15 k.w. generator. The water is pumped to the washing plant through a 16 in. pipe line and to the mines through a 12 in. pipe line through a distance of 1,200 ft. and 800 ft. respectively. The pumps furnish 4,000 gallons of water per minute at 200 pounds pressure.

Pumping station

Beneath the pumping station is a concrete reservoir, 50 ft. square and 20 ft. deep for a water supply. The water is taken into the reservoir through a culvert leading from an adjoining creek. The company, at the time of the writer's visit, was building a dam across the creek so as to insure a good water supply at all times. The mud from the waste water or mud pond settles out and allows the water to flow back to the creek above the water supply dam.

The plant is electrically driven throughout, the current being supplied by the Southern City Power Co. It comes into the company's transformers at 22,000 V. and after going through a set of 3-250 K.V.A. transformers, it is reduced to 220 V. and 110 V. The 220 V. is for the plant, while the 110 V. is for village lighting purposes.

The washing and dry storage buildings are of timber construction, while the drying building is of steel. It was also necessary for the company to build 17 houses for their employees on the plant site. These houses are completely equipped with electric lights and running water. Completing the system is a commissary and supply house, which is also run by the company.

Jas. A. Barr was consulting engineer in charge of design and construction. A. E. Clagett is superintendent at this plant.

Ohio Mineral Aggregate Rate Case

THE LATEST ACTION in regard to freight rates on road building materials has been taken in Ohio. The Public Utilities Commission of that state has, upon its own motion, re-investigated the rates and charges now in effect for the transportation of freight and intrastate traffic upon the railroads and railways. The Ohio State Highway Commission has brought action on behalf of road building materials and employed a traffic expert to present their case.

The question involved was whether the rates on Ohio intrastate traffic on the commodities under consideration were just, reasonable and non-discriminatory.

The respondents answered by proposing to reduce present rates 18%, to take effect September 1 and be effective four months, during which time a conference should be held between shippers and carriers to make further adjustments for 1922. The principal witness for the carriers admitted the importance of local competition in the making of rates and defended the 60-cent rate for 44 miles into Cincinnati on that basis. The revenue producing element of rates was deemed most important at this time. The carriers offered in defense a statistical statement of finances for the first six months of 1921, showing an average of 1.8%, which is considerably lower than the 6% allowed by the Transportation Act, 1920.

The Highway Commission refused the carrier's proposal, whereupon the railways withdrew their proposition, including the conference, until the decision of the Utilities Commission shall have been received.

It was evident at the hearing that the railways had begun to realize that certain rates must come down. They must be convinced that not only the general level of rates should be lowered, but that reasonable competitive relationships should be restored.—"Weekly Letter" of the Indiana Sand and Gravel Producers' Association.

How Federal Road Aid Stands at the End of Five Years

ON JUNE 30, 1921, the close of the fifth fiscal year since the passage of the Federal aid road act, which is administered by the Bureau of Public Roads, United States Department of Agriculture, the States and Federal Government had completed 7,469 miles of road, and 17,977 miles were under construction. Including the work completed on projects still under construction, the States have completed work which entitles them to draw on the Federal Treasury for $118,915,515. There is also a balance allotted but not yet earned on projects now under construction amounting to $66,375,636. Of the two appropriations which have been made for Federal aid there is now only $18,793,544 remaining unobligated. Twelve of the States have obligated their entire allotment and several others have small amounts to their credit.

During the last fiscal year the total of completed projects jumped from 1,677 to 7,469 miles, and the projects under construction increased from 14,940 to 17,977 miles. The money earned by completion of work has grown from $40,097,881 a year ago to $118,915,515 at the end of this fiscal year. The amount earned during the year was $78,817,634, or nearly twice as much as the amount during the previous four years.

The new projects submitted during the year bring the total amount of Federal aid obligated up to $247,946,456, as compared with $109,830,366, which was the amount obligated on June 30, 1920. At this rate it is expected that the small balance of $18,000,000 still unobligated will be taken up in a very short time.

Final Figures on 1920 Cement Production

THE PRODUCTION of Portland cement in 1920 was 100,023,245 barrels, exceeding that in 1917, the next highest year in production, by 7,209,043 barrels. This amount was an increase of 24 per cent over the production in 1919—80,777,935 barrels. The stocks at the mills increased from 5,256,900 barrels at the end of 1919 to 8,941,046 barrels at the end of 1920.

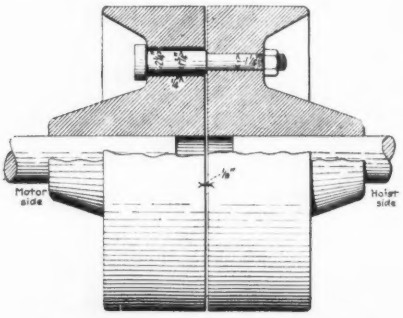
Estimates of the production and shipment of Portland cement in 1920 published by the United States Geological Survey February 14, 1921 (published in Rock Products, Feb. 26, 1921), were only about 0.3 per cent and 0.02 per cent, respectively, higher than these final figures for the year, compiled under the supervision of Ernest F. Burchard, of the United States Geological Survey, Department of the Interior.

The shipments in 1920 amounted to 96,311,719 barrels, valued at $194,439,025, as compared with 85,612,899 barrels, valued at $146,734,844, in 1919, an increase in quantity of 13 per cent and in value of 33 per cent.

Hints and Helps for Superintendents

Flexible Hoist Motor Coupling

AT the Fremont mines, Amador City, Calif., a simple flexible coupling was constructed and placed between the motor and the pinion shaft of the double-drum hoist. The motor is 200 hp. The bolt holes of one side of the coupling were enlarged from 1¼ in. diameter to 2¼ in.



Cheap, home-made, flexible coupling

Special bolts were made, the upper part of the bolt next to its head being made of ½ in. greater diameter than the lower portion. A sleeve made of rubber hose was placed in the annular space between the bolt and the inner wall of the bolt hole, as shown. The coupling, designed by Edwin Higgins, cost $75.—*Engineering and Mining Journal.*

"Dry Cleaning" Sand

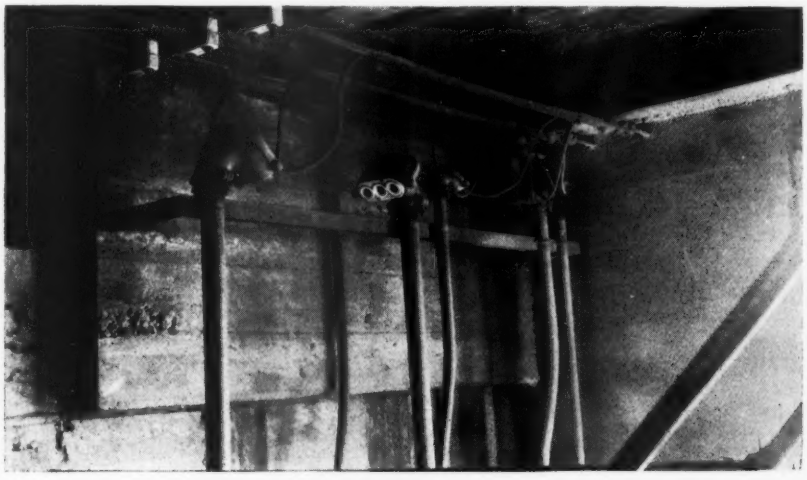
AN UNUSUAL METHOD of treating a local sand to make it conform to the U. S. Specifications for a concrete road has been adopted by the engineers of the Bureau of Public Roads in charge of California Federal Aid Project No. 41. Near the south end of the project no local sand could be found which would conform to the requirements of the specifications approved by the Bureau of Roads of the United States Department of Agriculture. These prescribed that the sand should contain no more than 5 per cent of material which would pass a 100-mesh sieve. The local sand analyzed about 15 to 20 per cent, which was entirely too high to permit its use.

This district is extremely arid, and in summer the temperature sometimes mounts to 120 deg. in the shade, so that the sand is very dry when worked. The device used consists of an ordinary conveyor which lifts the sand to a revolving screen. Material which will pass a one-fourth-inch mesh is discharged into a hopper under the screen and then through a narrow opening into a storage bin below. In falling from the hopper to the bin the sheet of sand passes directly in front of a nozzle which directs against it a current of air from a centrifugal air blower. By means of a pressure regulator at the blower the velocity of the air at the nozzle can be so controlled as to blow from the falling sand any desired percentage of the finer material.

The blower is operated by a belt from the same gas engine which operates the conveyor and revolving screen. The whole device is compact and inexpensive. The result is a satisfactory sand obtained at less cost than by any other method. The success of the plan depends, of course, on the dryness of the sand. If it were necessary to dry it the increased cost of treatment might make the process impracticable.

Example of Good Wiring

THE ILLUSTRATION herewith shows an example of modern electrical wiring, as installed in the new concrete and steel rock-crushing plant of the Giant Portland Cement Co., Egypt, Pa., which was described in the July 16, 1921, issue of ROCK PRODUCTS.

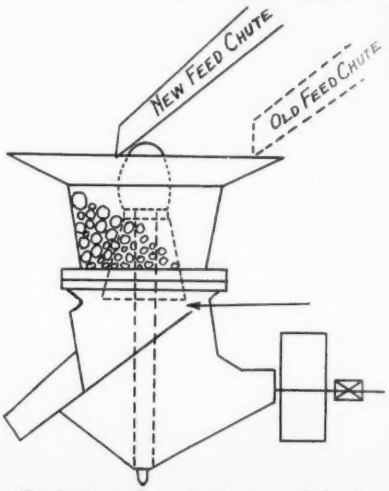


Main line and distributing heads

The main line is of heavy insulated conductor cable and is attached to the concrete roof by means of porcelain anchors or cleats. The main line is tapped to a service head and from here the line is enclosed in conduit until it reaches the motor. The joints are all heavily taped and the service heads are supported by a crossarm from the concrete wall. Such wiring is a precaution against crossed wires or short circuits with their impending dangers.

Chute Arrangement to Prevent "Gumming" of Gyratory Crushers

THE ACCOMPANYING illustration shows how the Interstate Sand and Gravel Co. took care of the "gumming up" of material in their gyratory crushers. This "gumming up" was caused by moisture in the material entering the crushers.



Feed chute for gyratory crusher, to prevent clogging

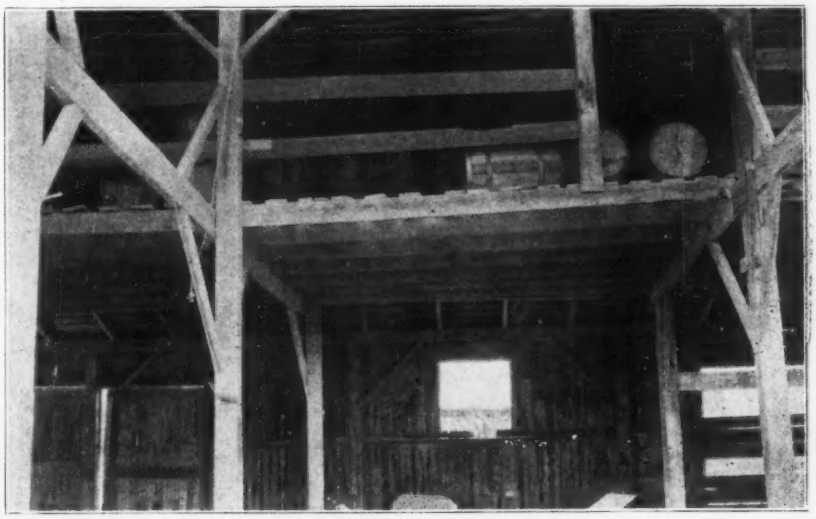
The arrow on the sketch points to where this trouble was greatest and the remedy applied is shown by the location of the new feed chute. This arrangement of having the material fed over the crusher head was devised by Chas. A. Adams, superintendent of the Interstate Sand and Gravel Co.'s plant at Libertyville, Ill., and is in use at that plant.

Lime kilns and cooperage shop of the Missisquoi Lime Works

Lime Barrel Runway

A SIMPLE method of handling lime barrels from the cooperage shop to the drawing floor and packing room at the kilns is used by one or two Vermont lime plants. As fast as the barrels are made and temporarily headed they are placed on an inclined runway or trestle between the cooperage shop and the kilns.

The barrels thus roll by gravity to an elevated gallery or runway in the kiln shed, where they are stored until needed for packing lime. This method keeps the empty barrels from cluttering up the working space and allows for a considerable storage of empty barrels. Undoubtedly the crude methods used here of handling the barrels could be improved upon by the installation of conveyors and elevators and packing bins, but the general layout seems to be a good one. The views herewith show the plant of the Missisquoi Lime Works at St. Albans, Vt.



Overhead runway for lime barrels

A Lime Quarry Car of the Side-Dump Type

A SELF-DUMPING lime quarry car is shown in the view below. The bottom of the car is an inverted V, the stone sliding out on each side, when the bars holding the swinging-door sides are released. This type is particularly desirable for feeding the kilns because it distributes its load better than the ordinary end-dump car.

The car shown is used at the Peerless White Lime Co. quarry at St. Genevieve, Mo. James Marr is the superintendent and Gordon Willis, St. Louis, Mo., is the president of the company. At this plant the cars dump into a crusher and not directly into the kilns; so the car is equally adapted to either use.

Packing floor of lime plant

A lime quarry car of the side-dump type

Sand Settling and Sand-Settling Devices

No. 9 Continued—Classification. Hydraulic Classifiers

By Edmund Shaw
Allen Cone Co., El Paso, Tex.

SINCE THE PUBLICATION of these articles began, the writer has several times been asked to explain why it is that one grain of sand falls faster through water than another grain. This would seem to be a good time to answer the question, as it is well to have such elementary matters understood before beginning to consider hydraulic classification. The answer in a few words is that the rate of fall depends upon the friction between the surface of the falling particle and the liquid through which it falls. The smaller the grain the greater surface is exposed in proportion to its weight, and hence the slower the falling rate.

Ordinary bodies falling in air, as we all know, fall at the same rate. If we take two balls of iron, one weighing a pound and one weighing ten pounds, and drop them from the same height at the same time they will reach the ground together. The friction of the air on such bodies is so slight that it cannot be noticed. But if we take one of these balls and cut and beat it into fine scales, as thin as tissue paper, and then drop these scales along with the other ball, we will find that the ball will reach the ground long before the scales have reached it. There is so much surface exposed on the flat scales that the friction of the air, and the pressure and the vacuum created by their motion, hold them back. You may illustrate this effect very nicely with a sheet of paper. Hold it as high as you can and then let it fall, and you will see that it will take two to three seconds to reach the ground. Now crumple the sheet into a ball and let it fall from the same height. You will find that it reaches the ground in less than a second.

This shows the effect of having a large surface exposed on a falling body. Now to explain why it is that the surface is greater, the less the weight, assuming that the bodies are of the same shape. If we take a cube 2 in. on each edge and cut it into eight smaller cubes, each 1 in. on each edge, we will find that while there was 24 in. of surface exposed on the larger cube, there are 48 in. exposed on all the smaller cubes. Hence they have twice as much surface exposed for their weight, and consequently they would fall slower through the water.

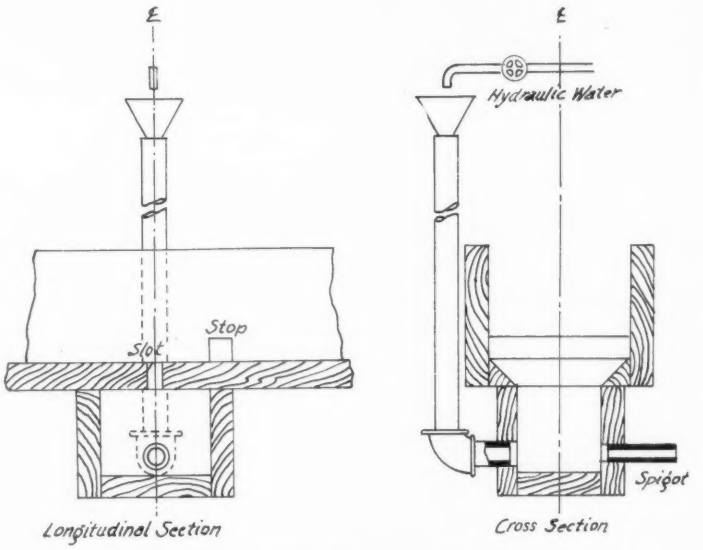


Fig. 24—Launder classifier. Simple form

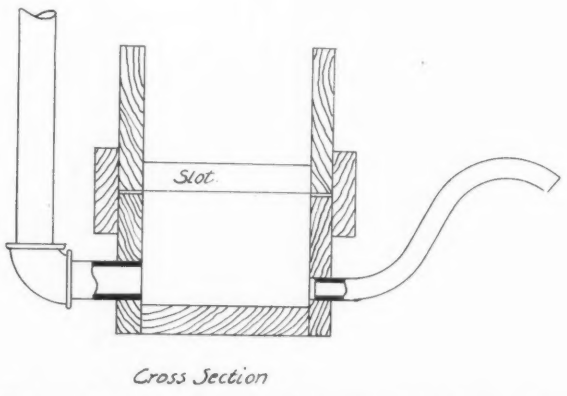


Fig. 25—Launder classifiers with gooseneck discharge pipe

Hydraulic Classifier

The hydraulic classifier in one of its simplest and most logical forms was described in the issue of July 16. It was shown there that this machine has in addition to the settling basin, which is common to all settling devices, a sorting column, which is supplied with water from another source than that of the feed water. This additional water is called hydraulic water, and it makes an upward current in the sorting column. Grains which have a greater falling rate than the upward velocity of the current in the sorting column will go down and pass out of the discharge orifice, which is usually called the spigot. Grains which have a less or slower falling rate than the velocity of the upward current will go up and will eventually pass out of the overflow of the settling basin. In this type of machine the settling basin acts

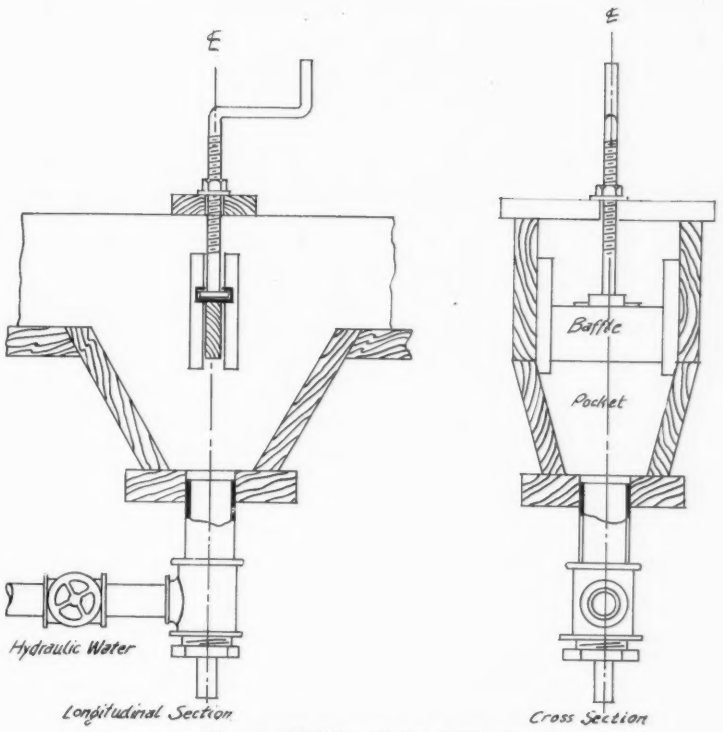


Fig. 26—Shallow picket classifiers

as a rough classifier and the work is finished by the current in the sorting column.

Simplest Form of Hydraulic Classifier

What is possibly the simplest form of hydraulic classifier is shown in Fig. 24. The settling basin is a part of the launder that brings the feed and takes away the overflow. To help the settling of the heavy particles at this place it is usual to put a stop or riffle just beyond the slot or hole which serves as a sorting column. This creates an eddy current in which the heavy particles settle easily. If they are heavy enough to resist the rising current flowing out of the slot, they will go down through it and into the chamber underneath.

This chamber has two pipe connections, one of which is attached to the hydraulic water pipe, while the other forms the spigot. This is only a short pipe nipple that can be easily changed, as it wears very rapidly. It is a good plan to use a stand pipe for the hydraulic water, as is shown in the drawing, so that the operator can see if the water is running or not, and also gauge its force somewhat by the flow in the pipe.

Sometimes the spigot is fitted with a gooseneck, as shown in Fig. 25. The gooseneck has the advantage that a larger diameter of pipe may be used, as the current through it is slower. On this account it may be run with somewhat less water and there is less danger of its choking with an oversized piece, such as is sure to come along occasionally. But having a slower current, there is greater possibility of its choking from a heavy rush of large grains in the feed. The writer's opinion is that it is a good thing to use the gooseneck, and that the advantages more than pay for the trouble of an occasional choke-up. If the gooseneck is made with smooth, flat curves as shown, it will not often choke.

Shallow Pocket Classifier

The next development, shown in Fig. 26, is that in which a shallow pocket or trap is placed in the launder to give a little greater settling capacity than is given by the launder with the riffle. Occasionally one finds the water chamber shown in the drawing placed below this pocket, but the more usual arrangement is that of a sorting column made of a pipe nipple with a tee at the bottom for connecting to the hydraulic water and the spigot. Above the pocket may be noticed a baffle placed across the launder for the purpose of insuring that all the grains go down into the pocket, and this baffle is made to slide up and down by means of the screw shown connected to it. The baffle not only insures all the grains passing through the pocket, but it makes an eddy in which the larger grains settle more readily.

In the arrangement shown in the drawing, the hydraulic water enters at one side of the sorting column, and there is a tendency for the upward current to be stronger on this side than on the other, which makes uneven work. To correct this a number of methods of admitting water evenly to the sorting column have been invented.

Methods of Admitting Hydraulic Water

One of the oldest methods for admitting water under equal pressure to all parts of the sorting column is that shown in Fig. 27. This classifier is officially known as the Anaconda classifier, but is usually called a "hog trough" by mill men. It consists of two "V" launders, one inside the other. The space between the two is closed at the top and forms a pressure box. The hydraulic water is admitted from the stand pipe shown at a point some distance from the sorting column, so there is an equal pressure all around the bottom of the sorting column where the water enters. This machine has been used a great deal in the copper mills in Montana and also in Michigan.

Prof. Richards introduced a method in

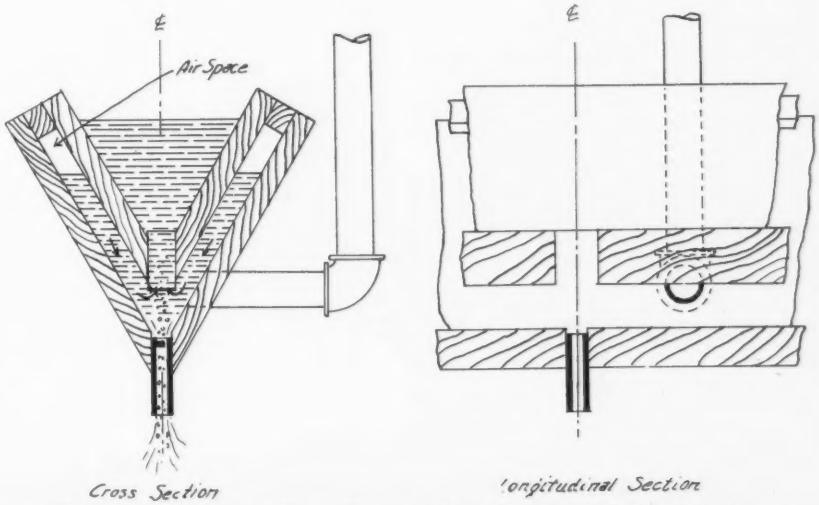


Fig. 27—Anaconda classifier. Slurry method of admitting hydraulic water

his Vortex classifier which has found a good deal of favor among mill men. In this device there is a water chamber at the bottom of the sorting column, and the water is admitted at one side of this water chamber, which is circular in section, and which therefore gives the water a whirling motion. Besides making the current even in all parts of the sorting column, this whirling motion has the same effect as increasing the length of the sorting column, as the water has a longer path. The figures published from the use of this classifier on iron ores, as compared with a standard laboratory classifier, show that it is capable of doing very good work.

Merrill, and some other inventors, have placed an anular chamber around the sorting column and have admitted the water through a number of small holes, and this has been found a good, practical method.

In the Deister classifier the sorting column is a continuation of the shallow pocket, and this pocket, or sorting column, is fitted with baffles that break up the main current into a number of smaller currents that do the work of classification. These machines have been sold in great number to be used with concentrating tables.

Uses of Shallow Classifiers

The use of launder and shallow pocket classifiers is to deal with the coarser grains, such as are always to be found dragging along the bottom of a launder which has an ordinary grade. The launder or the shallow pocket is all the settling basin that is needed and the coarse grains will drop out of any opening in the bottom. This was explained in the first articles of this series, in which the various forms of settlers were discussed. The hydraulic water is added to complete the work of classification begun in the launder by keeping the fine grains and clay from going out with them.

Classification is usually said to begin where screening leaves off, that is, the sizes above a certain mesh size are better treated by screens than by classifiers, while the sizes below this mesh size may better be treated by classification. For this reason, the shallow classifiers just described are right on the line, and they may sometimes be substituted for screens with very good effect. One reason for choosing the classifier may be that classifiers of the launder type require less headroom than screens.

As regards the limit of size which applies to classification, some authorities place it at five millimeters, which is a fifth of an inch. But this is purely an arbitrary figure, for the principles of classification do not stop at that size. As a matter of fact classifiers do rather cleaner work on coarse sizes than on fine. Whether to use a screen or a classifier on these middle sizes is a matter of expediency, to be determined by plant conditions.

Examples of Use

The writer has seen some very interesting examples of the uses to which a shallow classifier may be put. In one instance the material handled was a low grade, lead bearing material, which was sold for its fluxing value in smelting. It contained a number of small pieces of good lead ore, from the size of a "BB" shot up to a half inch in diameter. This would make a very valuable product if it could be separated. The metallurgist in charge of the plant put in a small shallow pocket classifier and secured 700 pounds of clean lead ore in the first eight hour shift. A somewhat similar arrangement has been used in the Lake Superior copper district for recovering shots of native copper.

The writer saw just the opposite use of a launder classifier in a small silver mill in Mexico. It was used to get rid of oversized pieces of quartz which had come from the leakage of broken screens, and which had gone into the concentrates. As these pieces were much larger than the concentrates, even though they were of much less specific gravity, the classifier removed them as a spigot product.

Hydraulic classifiers of this type are used to some extent in the place of screens in sand and gravel plants in Colorado and California and other mining states, where the men are familiar with their use from having worked in ore reduction mills.

Pocket classifiers made of tees and short vertical pieces of pipe have been used on suction dredges which pump sand into barges. In one instance two or three of these pockets were placed in the discharge pipe, which gave an opportunity of varying the two grades of sand which were made.

(To be continued)

Why Not the Whole Truth?

SIR—In a recent issue of ROCK PRODUCTS appears an article quoting from "Railroad Information," a pamphlet issued periodically by the Association of Railway Executives presumably for the purpose of enlightening the public.

In the particular report referred to the statement is made that shipments of sand and gravel and crushed stone for the seven weeks ending July 16, 1921, showed an increase of 50,280 cars, or 33⅓ per cent over the same period last year. Well and good; it is hoped that the figures are correct. But no mention is made of the fact that during the period of 1920 which was used as a basis of comparison the movement of sand and gravel and crushed stone was curtailed from 50 to 60 per cent because of preference in open top cars in favor of the coal mines. Taking into consideration the vast amount of construction work of all classes which has accumulated during the past five years, it is not surprising that the railway executives appear satisfied and even jubilant over a 33⅓ per cent increase in comparison with a period of building curtailment brought about by their indefensible policy of giving priority to the movement of coal.

The unfair comparison was made evidently so that the following statement would appear to be the logical conclusion:

> The traffic executives feel that these figures indicate that the movement of these two classes of commodities has not been retarded and does not require stimulation.

No mention is made of the fact, however, that a large part of the money appropriated and available for highway construction is being withheld pending a reduction in freight rates to a reasonable level; and that thousands of tons of sand and gravel and crushed stone are being hauled by water and trucks to avoid the exorbitant freight rates, while untold numbers of cars and locomotives of the railroads are lying idle. Will the public consider this good business on the part of the railway executives.

The article goes on to say that the movement of road-building materials is "characteristically a short haul business" which "precludes its consideration from a national point of view." While it is true that sand and gravel and crushed stone are widely distributed, yet the carriers by applying excessive rates have greatly restricted the potential market area. Moreover, since the states have practically been denied the right to adjust rates on the theory that intrastate rates shall not discriminate as against interstate rates, why is it that the matter is not a national issue? In addition, the carriers act as a unit to oppose proper rate adjustments. Why then should not the sand and gravel and crushed stone shippers unite to protect and promote their industries?

The producers of sand and gravel and crushed stone do not desire the railroads to haul their materials at rates which are not compensatory, taking into consideration the favorable transportation characteristics of the traffic. However, the fight will be continued until every producer of these commodities is accorded just and reasonable rates, irrespective of what the carriers may think with regard to the matter being of national import.

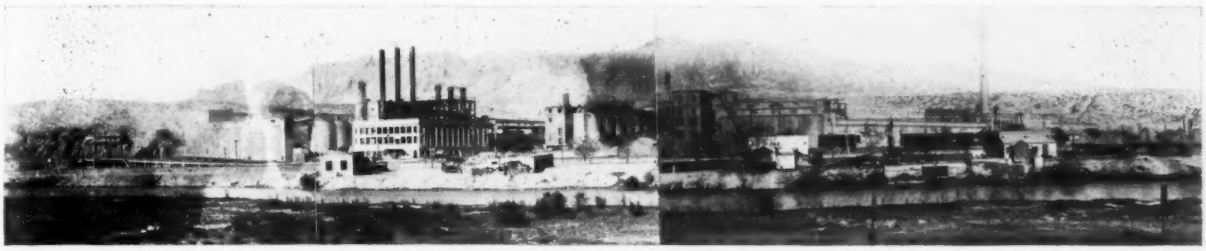
E. GUY SUTTON,
Executive Secretary, National Association of Sand and Gravel Producers.
Washington, D. C., September, 12, 1921.

Utilizing Waste Heat from Cement Kilns

Southwestern Portland Cement Company, El Paso, Texas, Installs System for Complete Recovery of Waste Heat Gases From Kilns

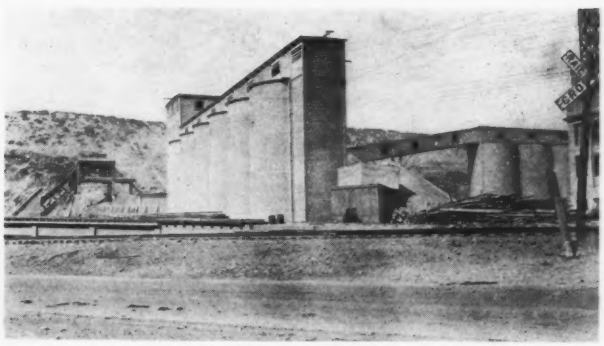
THE QUESTION OF FUEL ECONOMY in cement plants is one of vital importance, for in very few industries does the coal bill cut so large a figure in the cost of the product as in the manufacture of portland cement. It is a well known fact that only about 50 per cent of the actual fuel energy of the coal burned is utilized in the manufacture of portland cement. This figure includes both the kiln operation and the generation of power to operate the plant. In the actual burning operation only about one-third of the available heat is utilized, one-third goes out the stacks and the other third is lost in the heat carried in the hot clinker and the heat radiated and conducted by the kiln itself. Therefore it behooves cement manufacturers to keep abreast of the times in matters of fuel economy.

The importance of reliable and economical power plants for cement mills has been so generally recognized that it would be needless to lay stress in this article upon the value of superheaters, stokers and boilers capable of operation well above their rating for extended periods. The outstanding steam problem in cement mills is usually not connected with standard power plant practice but with the utilization of waste heat from kilns. This use of waste heat has passed

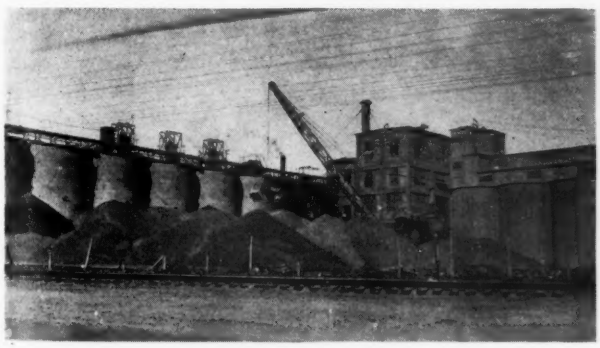


General view of plant taken from across the Rio Grande

Portion of quarry face, showing well-drill for blast-holing

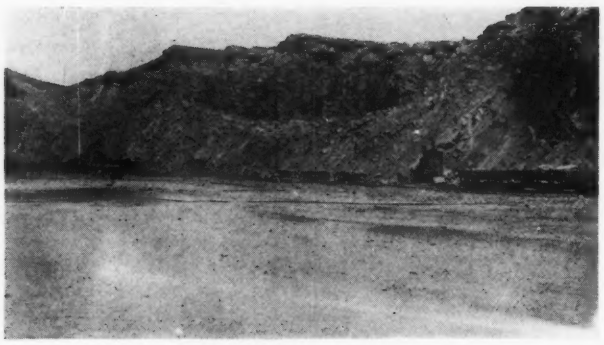


Raw storage silos



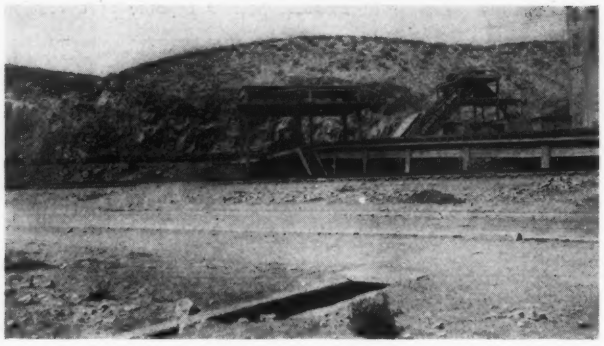
Clinker storage

Conveyor from rolls to storage before recrushing

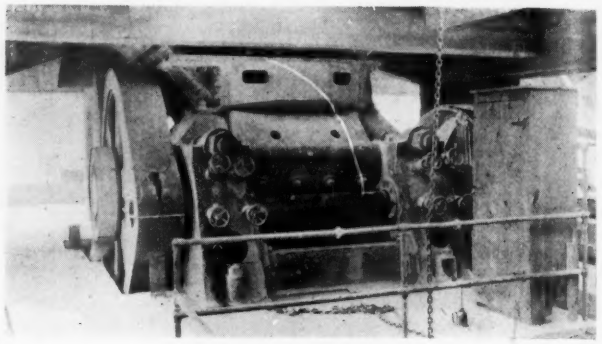


View of quarry operation

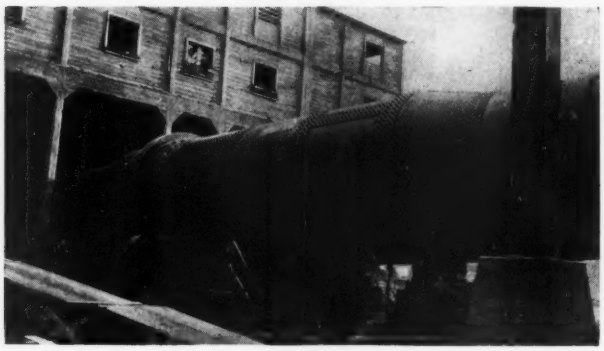
Steam shovel loading operation



Trestle to new crushing plant

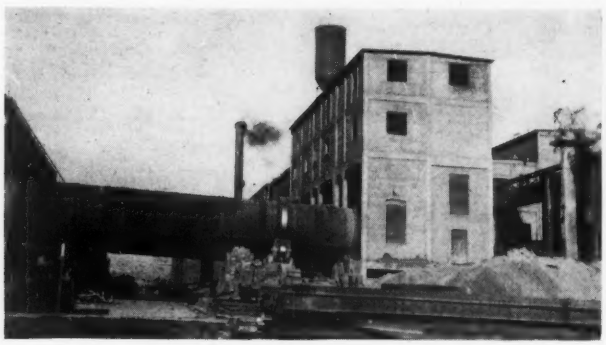


Crushing rolls

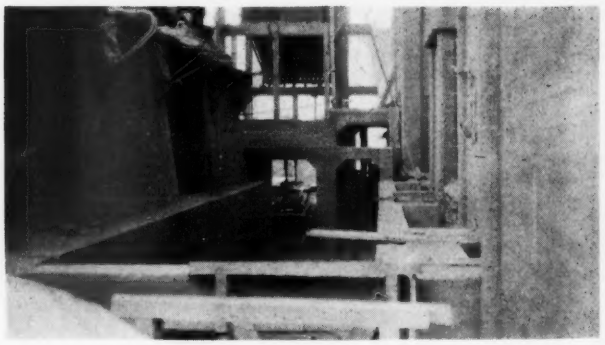


Ten-foot kiln section

Coal mill plant in background



Coal mill and kiln-firing end of plant

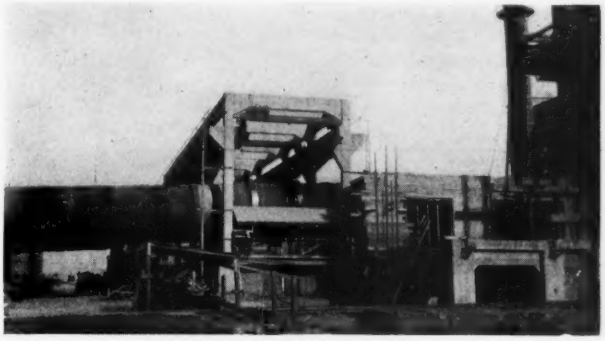


Gas expansion chamber for waste heat boilers. Stacks at the right

the experimental stage and there is no longer any reason of a technical nature for delay in adopting it. Its financial aspect is as attractive as its engineering aspect, for the utilization of waste heat means a very large annual saving in coal bills for a relatively small investment and also in a good many cases, an increased output of clinker through dust recovery.

While the economies that can be made in fuel consumption by the utilization of waste heat from cement kilns are very

important, it is also very important to maintain the same continuity and flexibility of operation of the kilns with waste heat utilization as without it. For this reason, the entire kiln, waste heat boiler, flue and stack layout should be studied critically with a view to maintaining continuous operation of the kilns. With this idea in mind the Southwestern Portland Cement Co., at El Paso, Texas, has installed what many consider to be one of the most modern waste heat recovery units to be found anywhere in the cement industry.



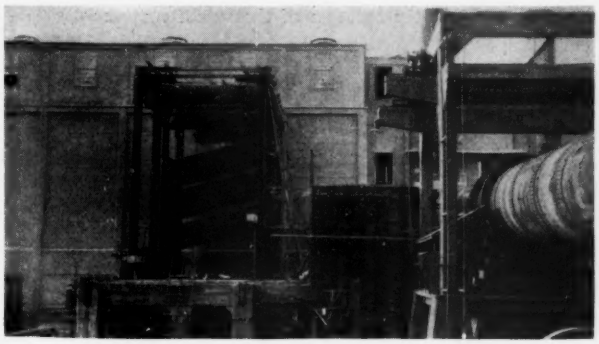
Substructure waste-heat recovery plant

The plant and quarry of the Southwestern Portland Cement Co. are located on the west side of the Franklin Mountains on the outskirts of the city of El Paso. The cement is manufactured by the dry process and the plant has three kilns, 8 ft. in diameter by 150 ft. in length, coal fired. (One kiln has a section 10 ft. in diameter.)

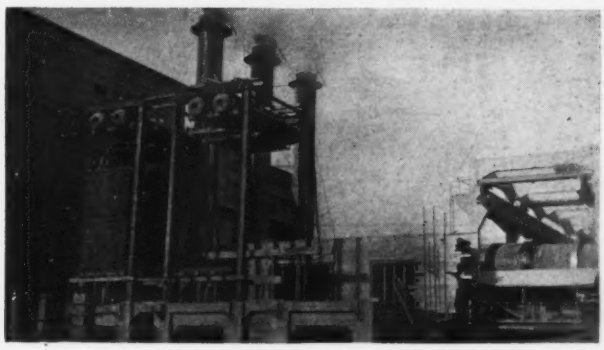
Waste Heat Boilers

There are three boilers for generating steam from the waste heat gases of the kilns. These are of the Babcox and Wilcox type, 16 ft. wide, 24 ft. high and 18 ft. in length, each being rated at 765 b. h. p. and each having a heating surface of 7650 sq. ft., working under a pressure of 225 lbs. The boilers are equipped with Foster superheaters, and to complete the waste heat unit the boilers are fitted with Green economizers and Green radial flow fans. The economizers consists of 40 sections, each 7 tube wide, with a heating surface of 3570 sq. ft. and capable of heating 18,300 lbs. of water from 200 degrees to 340 degrees for 90 lbs. of gas, the gas entering the economizer at a temperature of 468 degrees. The economizer is also capable of heating 27,497 lbs. of water from 200 degrees to 345 degrees for 110 lbs. of gas, the gas entering the economizer at a temperature of 500 degrees.

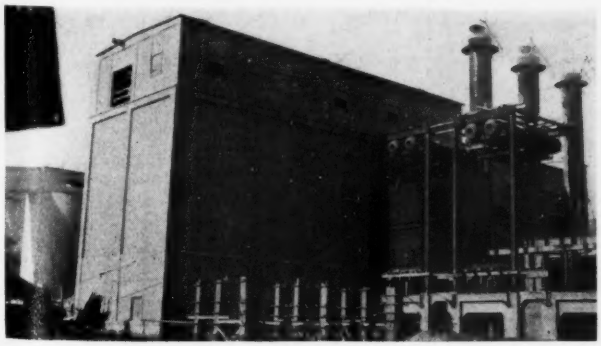
Detail of joint between 10-foot and 8-foot kiln sections



Waste heat boiler plant under construction



Installing the boiler tubes



Boilers and raw grinding end of mill

Feed-end of kiln showing sheet-steel hood for saving heat

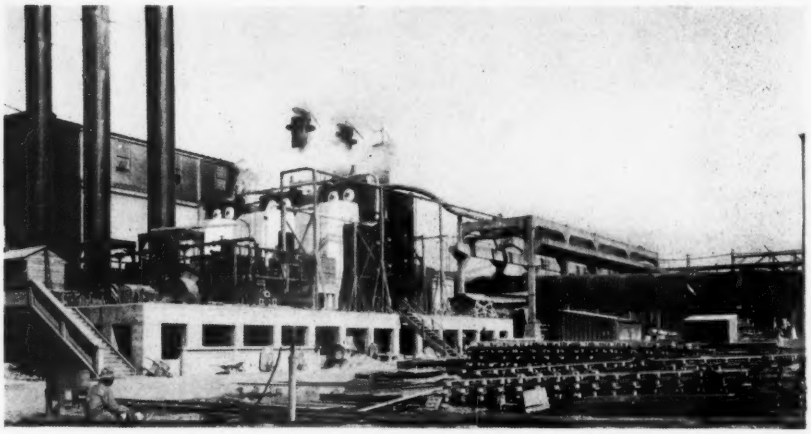
Two pulverized coal burners per kiln

(All degrees in terms of F.) The fans are constructed of steel plate, each measuring 7 ft. in diameter and each being run by a separate 100-h.p. induction motor. These fans furnish the induced draft and their speed may be changed as desired. Completing the unit is an 80-ft. stack for each fan into which the gases are exhausted. Each boiler and economizer is also equipped with soot blowers. The waste heat boiler settings are built with red brick, insulated with "Sil-O-Cel" and lined with fire brick. The boilers are also steel encased so as to prevent any infiltration of air.

Waste Heat Flue

The collecting flue for the waste heat gases connects with each kiln housing. Vertical dampers are arranged at each flue opening so that any kiln or boiler may be separated from the main flue.

The distributing flue into which the gases pass from the collecting flue is located directly in front of the waste heat boilers and each boiler is also provided with a water-cooled damper, thus insuring continuity and independence in operation.



Waste heat boiler plant before the erection of the superstructure

Dust chamber. Boilers on the right

The flue and all connections are built of reinforced concrete. The bottom of the economizers, boilers, collecting and distributing flue and kiln chambers are provided with a system of inverted "V" hoppers, into which the dust collects. Underneath the hoppers is a tunnel containing a screw conveyor which connects to every hopper. Thus the dust is drawn off from the hoppers into the screw conveyor and returned to the raw material silo storage.

In connection with the above screw conveyor it is interesting to note that in cement plants it is customary to figure a 12-in. screw conveyor running at approximately 80 r.p.m. will be able to handle 30 tons of dust per hour, requiring only a 5-h.p. motor, for 125 lineal feet. Over this length the power required will increase 20 per cent for each 50 linear ft. increase.

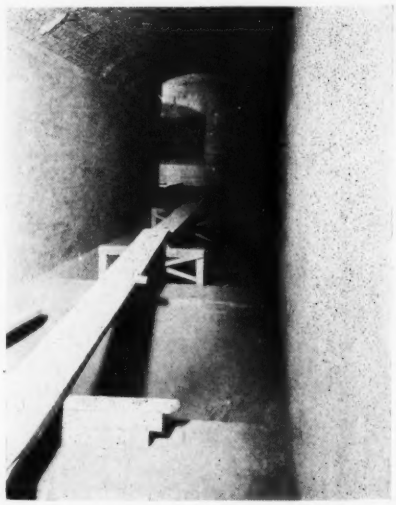
The kilns, as mentioned previously, are three in number, with a capacity of 40 bbls. of clinker per hour each, and with a 120-lb. (10,500 B.t.u.) coal consumption for each barrel of clinker produced. From the kiln output and the coal consumption was estimated the total gas weight which in this case amounted to 300,000 lbs. per hour. The gases enter the waste heat boilers at 1250 degrees F.

Power Plant

In addition to the waste heat boilers, the power plant proper is provided with four 400-h.p. Babcox and Wilcox boilers, equipped with Green chain grate stokers and also with Green economizers. These were used prior to the installation of the waste heat boilers and are used now only in case of emergency.

The power plant consists of two 750 k.w. and one 2000 k.w. Westinghouse Parsons type horizontal turbines, direct connected to three surface condensers. The condensate from the turbines is returned through the feed water heaters located in the old boiler house and then through a 6-in. pipe line to the feed water heaters in the waste heat boiler plant, to the pumps, economizers and finally to the waste heat boilers, about 800 ft. away.

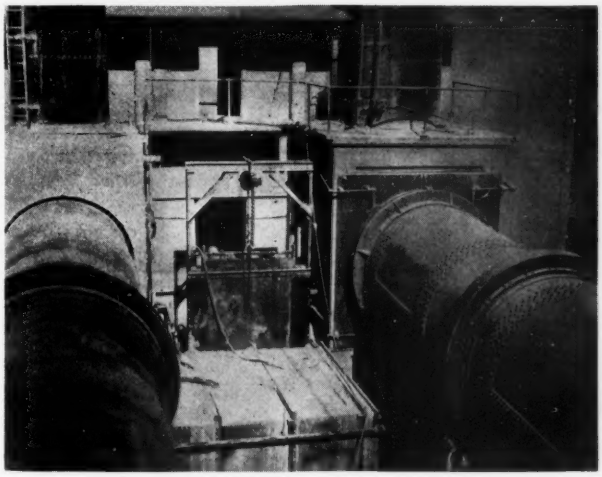
The raw water required for boiler



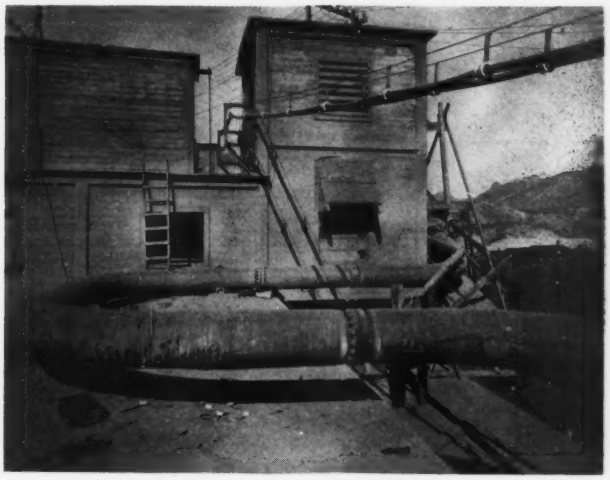
Dust chamber showing hoppered bottom

Close view of economizer connecting breech and waste-heat boiler

View showing waste-heat boilers, breeches, economizers, fans, and stacks



View showing damper for kiln gases



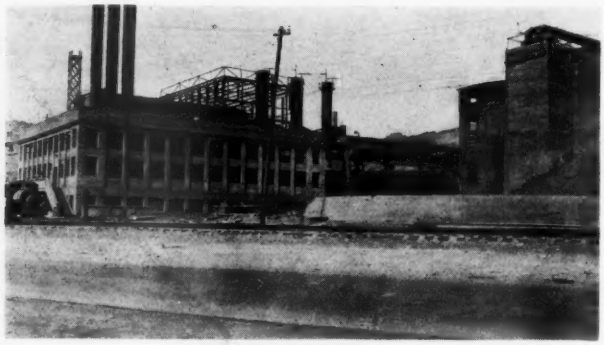
Expansion joint in steam line to power plant

use is treated by a Permutit system being fed into the hot well pumps at the old power plant. The condensing water is pumped directly back to the river. The spray system is used to cool the condensing water in case the river pumps do not furnish sufficient capacity. A series of settling basins is provided for in the settling pond to settle out the mud before the water is returned to the condensers. The main plant water supply is pumped from the Rio Grande River at a pumping station located a mile from the plant and up the river. This water goes to a large reservoir provided with a dirt dam from which it flows by gravity through a cast iron pipe line to the plant. The water from the Rio Grande is used only when an analysis of the water shows it to be fairly pure.

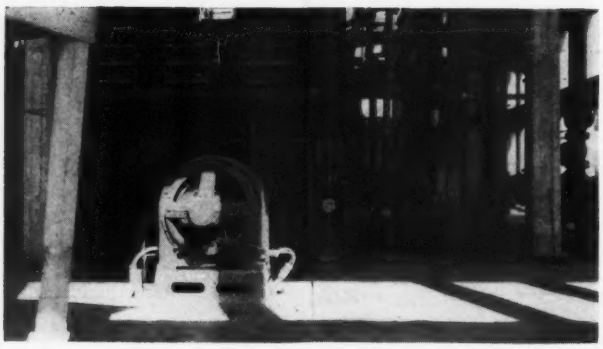
All the power is generated at 440 v. at which the bulk of the motors run. A system of three-500 kva step up transformers are provided to step up the current to 2300 v., which is carried over to the raw mill on three conductor overhead cables to the reduction station where it is again stepped down to 440 v. This, however, is only a temporary arrangement since in the near future all equipment will be operated on 2300 v.

A 750 kva synchronous condenser is provided for in the power plant that corrects the power factor to about 82 or 83 and also relieves the heating effect on the turbo-generators. To this date the company has not run any conclusive tests to determine as to what saving has been effected on the coal bill and as to what power has been developed, except to show a barrel of cement finished and shipped on 1,545,000 B.t.u. for all fuel purposes.

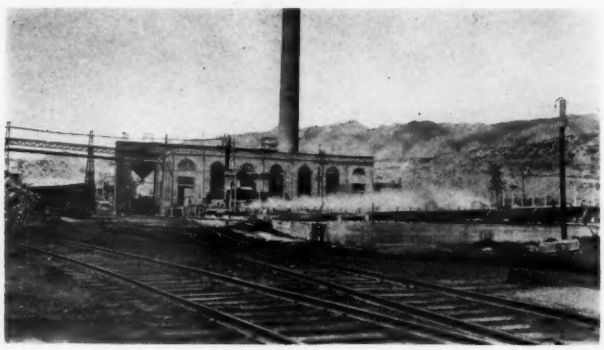
Waste-heat boiler plant kilns



Waste-heat boiler plant building during construction

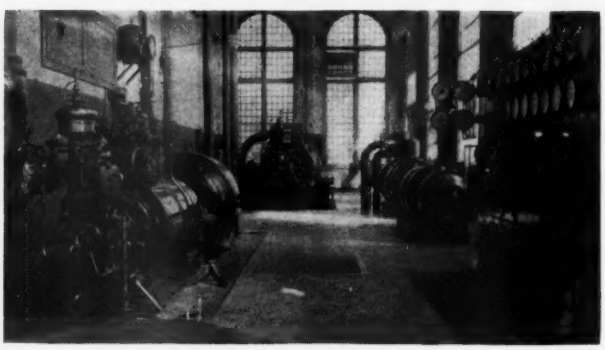


Economizer, fan, and pump



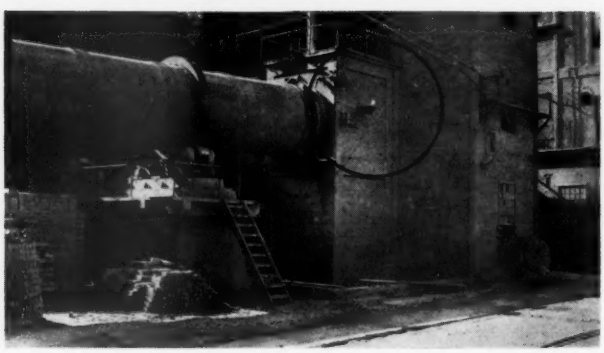
Power plant and cooling pond

Switchboard in power plant



Horizontal turbines and auxiliaries

Brown duplex recording pyrometers in superintendent's office



Discharge end of kilns. Note thermo-couple installation

The average maximum kilowatt peak ranges at 2400 k.w. (this is on two boilers only), while the average minimum peak is from 1800 to 1900 k.w. The switchboard is of the usual type, the transmission lines being all cable and underground, the only exception being that of the lines going to raw mill. All the cables are of the lead covered paper insulated type and laid through fibre conduit. The speed of the fans in the waste heat boiler plant is controlled by remote

control through apparatus located on the kiln room floor.

Pyrometers

It is interesting to note that this plant is unusually well supplied with a complete pyrometer system, as can be seen from the accompanying drawing. All the thermocouple compensating leads for pyrometers are run to a cold junction box located in the superintendent's office. A portion of the leads are tapped off for the indicating instruments located in the waste heat plant and on the kiln burning floor. In each case switchboards are provided so that the temperature of any one particular thermo-couple may be recorded. Nineteen thermo-couples are provided in all, there being one on each kiln for measuring the discharge gases, one in the waste heat collecting flue, one in the distributing flue, one at the entrance to each boiler, one at the economizers, one at the discharge and one at each stack. As can be seen from the accompanying drawing all pyrometer wiring is in conduit, which eliminates trouble from wire breakage, etc.

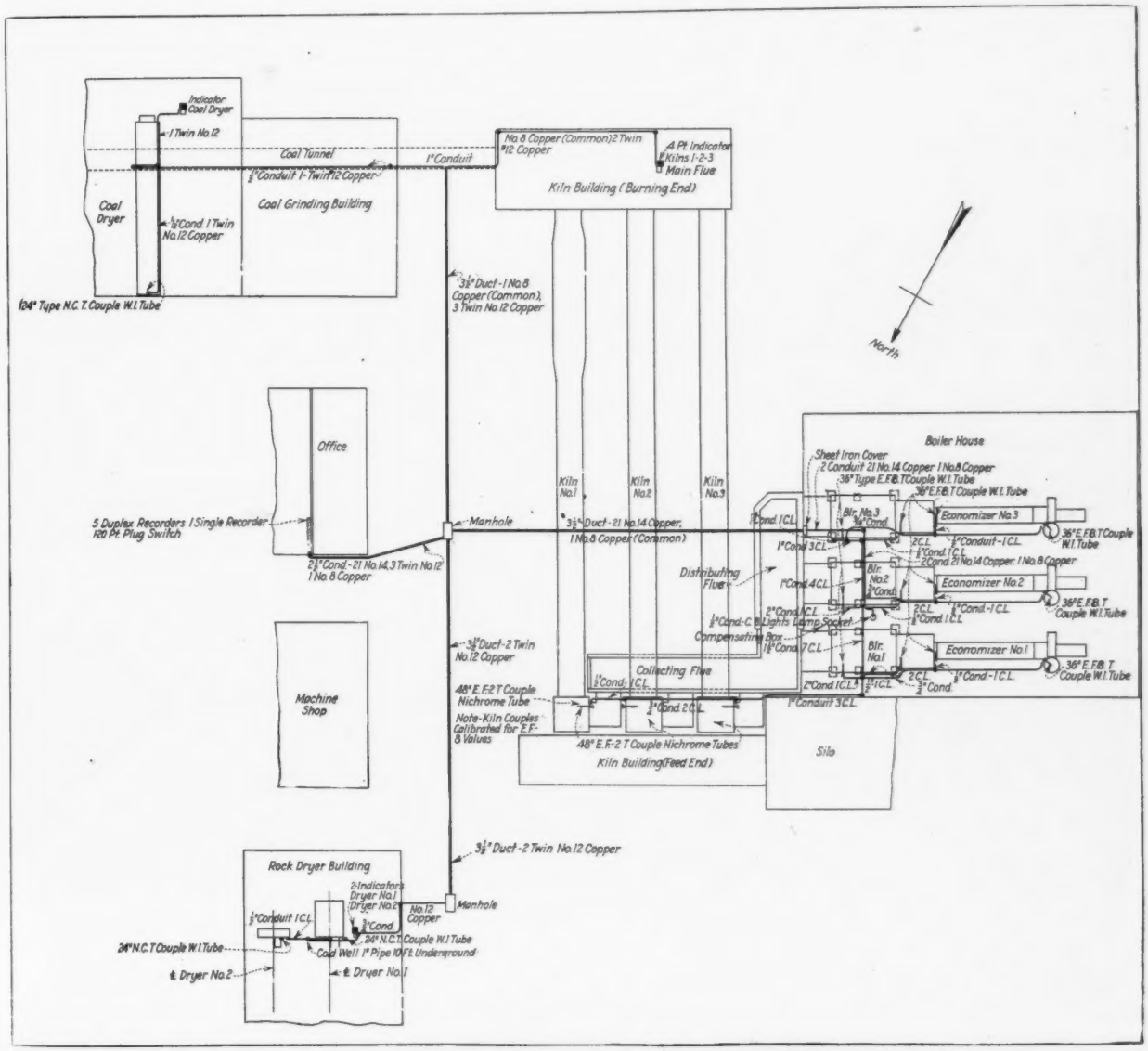
All the drives in the plant are direct connected to motor, the aim of the company being to eliminate shafts and belting wherever possible.

Crushing Plant

Another recent accomplishment at the Southwestern Portland Cement Co. was the erection of a new crushing plant, which is illustrated by many of the accompanying pictures. The rock and shale are brought over the trestle and dumped into the preliminary crusher, which in this case is a 36x60-in. Fairmount roll, driven by a 150-h.p. motor. The rock is reclaimed by a 60-in. pan conveyor running on a 45 degree inclination, which deposits it in an open storage of 200 tons capacity. From here it drops onto a 5-ft. pan feeder running on a 10 degree inclination which deposits the material into a No. 7 Williams (Jumbo type) mill for further reduction. From here it goes by a system of conveyors to the mills for grinding and then to the kilns for burning.

Personnel

The Southwestern Portland Cement Co., besides operating the mill at El Paso, also operates a mill at Victorville, Calif., reputed to be one of the finest wet process mills in existence. The president of the company is Carl Leonardt; vice-presidents, C. C. Merrill, C. Boettcher and A. Courchesne; secretary and superintendent, O. J. Binford; treasurer, James G. McNary; chief chemist, R. R. Coghlan; general auditor, Max A. Koffman, sales manager, H. C. Swearingen; chief engineer, W. C. Rieth.


Indicator Coal Dryer
1 Twin No.12
Coal Tunnel
1" Conduit
1/2" Conduit 1-Twin 12 Copper
Coal Grinding Building
Coal Dryer
1/2" Cond. 1 Twin No.12 Copper
No.8 Copper (Common) 2 Twin #12 Copper
4 Pt. Indicator Kilns 1-2-3 Main Flue
Kiln Building (Burning End)
124" Type N.C.T. Couple W.I. Tube
3 1/2" Duct-1 No.8 Copper (Common), 3 Twin No.12 Copper
North
Office
5 Duplex Recorders 1 Single Recorder 120 Pt. Plug Switch
2 1/2" Cond.-21 No.14, 3 Twin No.12 1 No.8 Copper
Manhole
3 1/2" Duct-21 No.14 Copper, 1 No.8 Copper (Common)
Kiln No.1
Kiln No.2
Kiln No.3
Boiler House
Sheet Iron Cover
2 Conduit 21 No.14 Copper 1 No.8 Copper
36" Type E.F.B.T Couple W.I. Tube
Blr. No.3
Economizer No.3
Blr. No.2
Economizer No.2
Blr. No.1
Economizer No.1
Distributing Flue
Compensating Box
Lights Lamp Socket
Collecting Flue
Machine Shop
3 1/2" Duct-2 Twin No.12 Copper
48" E.F.2 T Couple Nichrome Tube
Note-Kiln Couples Calibrated for E.F. 8 Values
48" E.F.-2 T Couple Nichrome Tubes
Kiln Building (Feed End)
Silo
Rock Dryer Building
2 Indicators Dryer No.1 Dryer No.2
Conduit 1 C.L.
No.12 Copper
24" N.C.T. Couple W.I. Tube
Cold Well 1" Pipe 10 Ft. Underground
t. Dryer No.2
t. Dryer No.1

Pyrometer layout, Southwestern Portland Cement Co.

Lime Exhibit at the National Chemical Show

THE EXHIBIT of the National Lime Association at the National Exposition of the Chemical Industries in New York City the week of September 12 has gone a long ways toward putting the lime industry "on the map." The exhibit, as the two illustrations herewith show, was dignified, instructive and effective—was praised in the highest terms by men of prominence in the chemical industries—and was an eye-opener to the rank and file of industrial chemists and the general public.

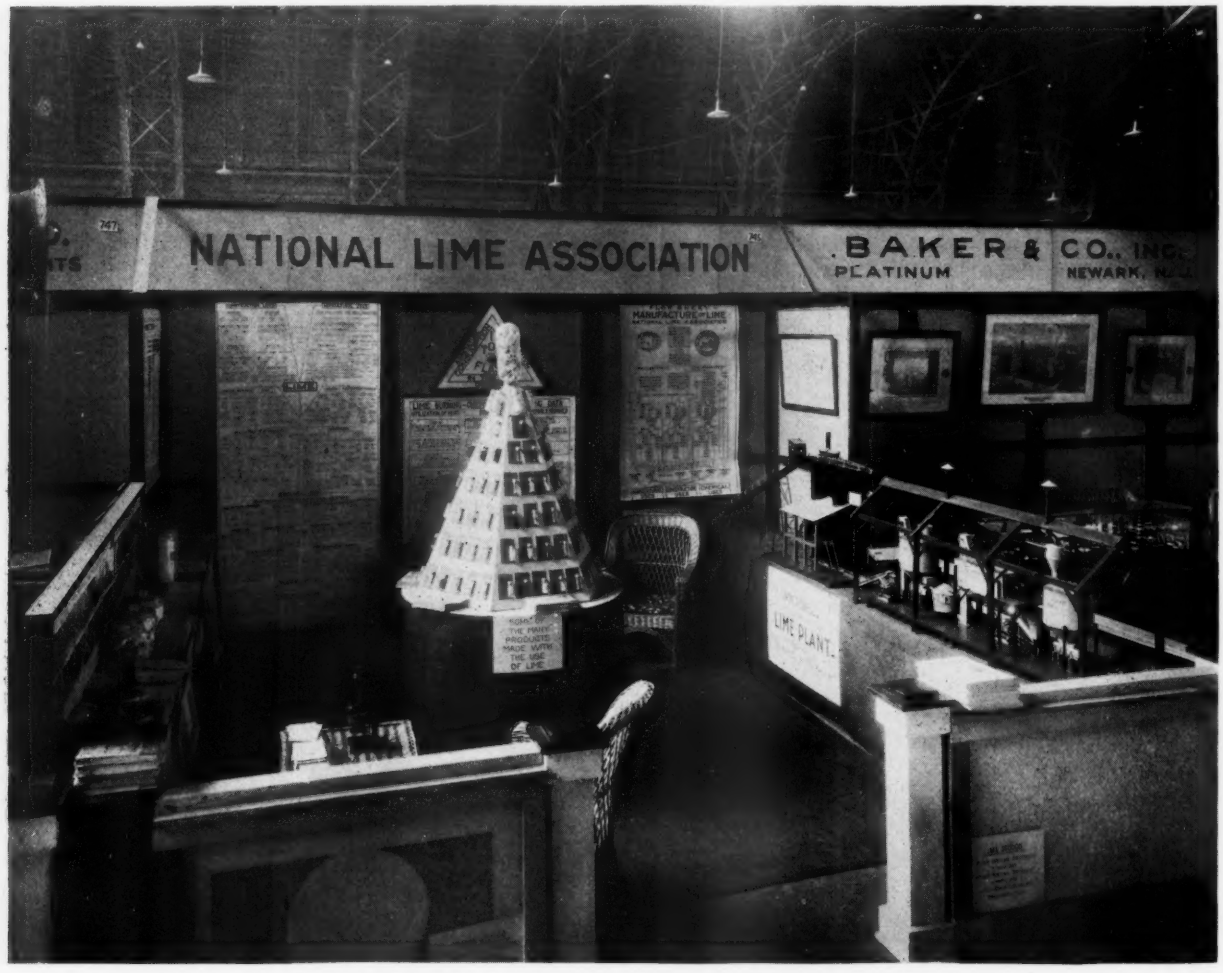
Undoubtedly the exhibit served to greatly increase the respect for lime both on the part of the user and producer. For the first time, perhaps, public emphasis was placed on the fact that lime is a chemical agent as well as a popular building material. Proof was there that lime can be, and is, used to perform a greater variety of chemical functions than any other chemical with the possible exception of sulphuric acid.

The exhibit included a large wall chart showing graphically these various chemical functions of lime in a systematic arrangement, with the products made through the use of lime, and the industries making use of lime. This chart was the most complete and comprehensive gotten out by any industry. It proved the most popular feature of the exhibit and many requests were received for copies.

The diagrammatic chart was supplemented by a pyramidal display of samples of 120 products made with the use of lime. These samples were contained in small glass bottles, with cards attached on which was written the particular chemical function of the lime in the manufacture of this product.

These cards were conspicuously attached to surface of the pyramid, while on the top of the pyramid were bottles of hydrated lime. The whole was surmounted by a large bottle of quicklime, designed to show the course of the material through the forms of hydrated lime into all the products below derived from the use of the hydrated lime.

Another popular feature of the exhibit was the model of a lime plant. This model, used in connection with a chart outlining the manufacturing process, served to impress the visitors with the



Lime exhibit at the Exposition of the Chemical Industries

fact that lime making is not such a simple rule-of-thumb industry as has been the popular conception for generations. The fact that the lime industry has now become a complicated technical process was further borne out by a display of photographs of actual plants, so selected by ROCK PRODUCTS for the exhibit of the National Lime Association, as to show all the various steps in lime manufacture, as exemplified at modern plants.

It is estimated that fully 100,000 people inspected this exhibit, and the lime industry is to be congratulated for having taken a big step forward.

New Gypsum Fertilizer Manufacturer

THE GYPSUM-FERTILIZER CO., with its principal place of business in Los Angeles, Calif., has been organized under the laws of California with an authorized capital of $75,000. Of this the company has obtained permission from the State Corporation Department to sell $50,000 at the par value of $100 a share. It is understood that all of this stock has been taken up.

The company will engage in the production, manufacture and marketing of fertilizers and land plasters consisting of gypsum. Its supply of raw material will be largely drawn from a region within a radius of forty-five miles of Los Angeles, which is declared to contain millions of tons of a remarkably high grade variety of gypsum. The deposits are located about eight miles beyond Saugus and it is expected that the company will be in a position to make shipments of fertilizer within the next month.

The officers of the company are: President, Theodore Stensland; vice president, A. G. Burgess; secretary and treasurer, E. G. McCurdy.

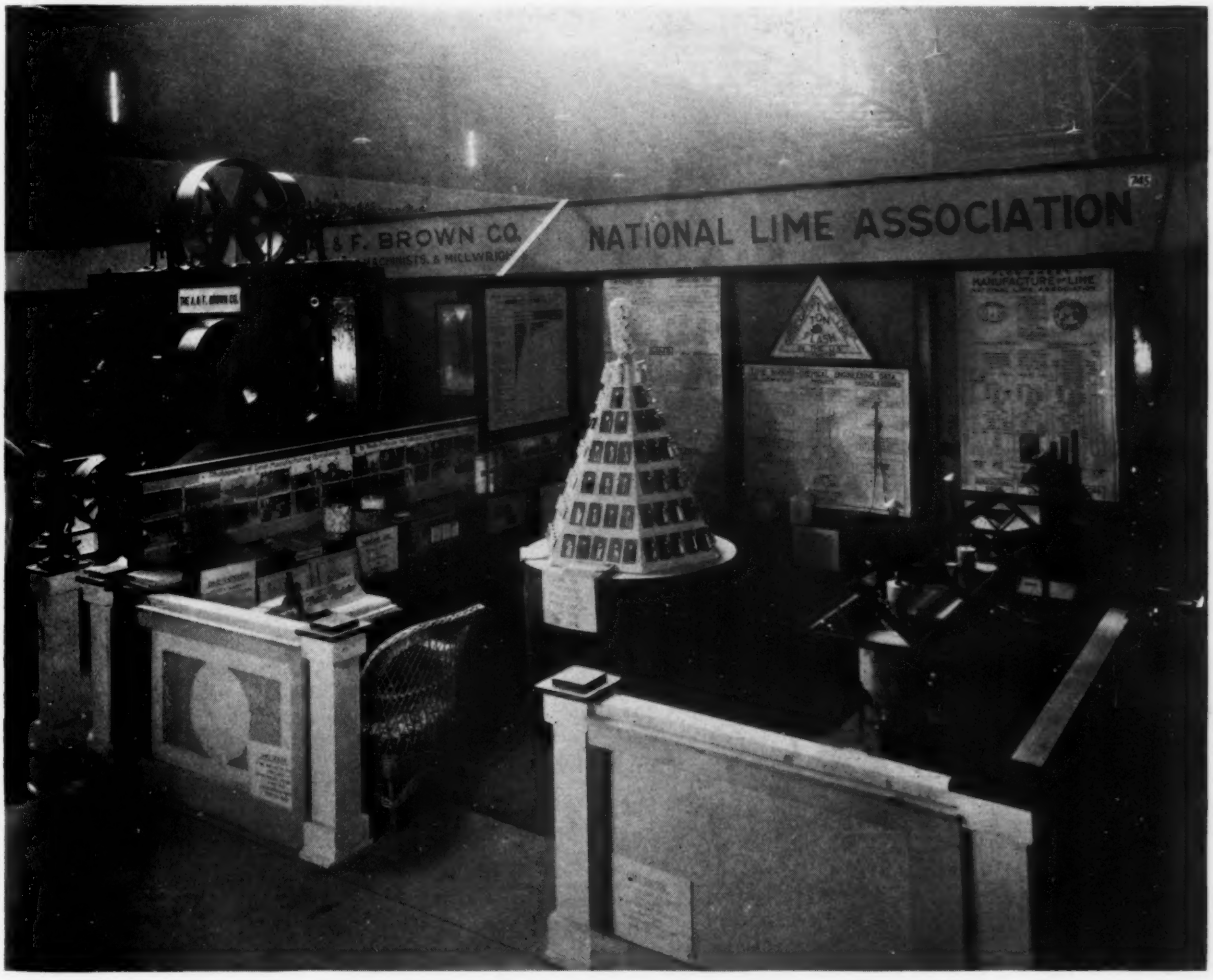
The foundations for the mill are already laid and the structure will be rushed to completion. The installation will consist of crusher, pulverizer, oscillating screens and sacking machines. The product will be marketed in 100-pound sacks. Within thirty days the officials promise to have the mill producing and anticipate no difficulty in finding a ready market for the capacity of the plant. The gypsum fertilizer is specially adapted to citrus fruits and alfalfa, while also used in other crops.

Arizona Gypsum Company Leases Properties

CONCLUDING negotiations which have been in progress for several weeks, the Arizona Gypsum Co., at a meeting in Phoenix recently, at which 130,000 shares of its capitalized 160,000 were represented, leased its properties to the Arizona Gypsum Products Co. of Los Angeles.

Under the terms of the lease agreement, the lessees must open the property promptly, they must construct a mill in Phoenix, work on it to begin within five days, and to be completed within 90 days. The lessees bind themselves to take out 60,000 tons a quarter.

The negotiations for the lease were conducted through T. N. McDevitt. The officers of the Arizona Gypsum Co. are J. C. Callhan, president, Charles Peterson of Mesa and H. B. Wilson of Phoenix, vice-presidents, and Frank H. Swenson of Phoenix.



Model lime plant at the right—Note the wall charts

National Association Reviews Transportation Situation

Secretary of Sand and Gravel Association Sees Much Improvement Since June

THERE IS EVERY INDICATION that as a result of our conference with the traffic representatives of the railroads in Washington on June 2nd, 1921, the carriers are becoming convinced that our claims for lower rates on sand, gravel and crushed stone are well founded as evidenced by the fact that they are making voluntary reductions. While the amount of these reductions is not sufficient to bring the rates on sand, gravel and crushed stone to a just and reasonable level, at the same time the decreases will afford a partial relief and pave the way for subsequent readjustments and a possible general reduction.

Eastern District

The reductions which are being made by the railroads are more noticeable in the Eastern District. Producers have been advised of the relief which has been granted by State Commissions of New York, Michigan, and New Jersey; also the voluntary reductions made by the New York, New Haven & Hartford early this year between points on their lines in the New England States.

We are now in receipt of tariffs of the Boston & Maine Railroad and the Maine Central Railroad which reflect material reductions in the rates on sand, gravel and crushed stone between points on these railroads. The Boston & Maine Railroad, serving the States of Maine, Massachusetts, New Hampshire and Vermont, effective intrastate August 15, 1921, and interstate September 10, 1921, have revised their mileage scales on sand, gravel and crushed stone to a basis very much lower than that existing elsewhere in the Eastern District. The mileage scale on sand indicates a rate of 45c for the first 20 miles with a gradation in the rates as the mileage increases up to 360 miles, for which distance the rate is shown at $1.40 per ton. The basis for gravel is 5c and crushed stone 25c per ton higher than the scale rates applying on sand.

The Maine Central Railroad, effective intrastate August 16, 1921, and interstate September 15, 1921, has reduced its rates to basis of 60c per ton for the first 20 miles gradually increasing to $1.50 per ton for hauls of 550 miles. These two scales will be printed in full in the September issue of the Bulletin.

We are also in receipt of advices that the railroads serving the States of Pennsylvania, New Jersey, Maryland, Delaware and West Virginia are now preparing tariffs reducing both state and interstate rates on sand, gravel, crushed stone and slag to a basis of 15% higher than rates in effect August 25, 1920, or immediately prior to increase of 40% authorized by the Interstate Commerce Commission under Ex Parte 74. The Eastern carriers will make application to the Interstate Commerce Commission to establish these rates on one day's notice and will also provide in the tariffs showing the new rates, that they will expire December 31, 1921.

It is assumed that the carriers in proposing to make the reduced rates apply for a limited period have done so to determine the effect the decrease will have on the movement of sand, gravel and crushed stone. It must be remembered however, that the reductions came too late to stimulate the development of construction work for this season and this fact will have to be taken into account by the railroad officials in drawing conclusions.

Irrespective of the decision of the Public Service Commission of New York, early this year, ordering cancellation of the 40 per cent increase in intrastate rates on sand, gravel, crushed stone and slag, the railroads are now considering the proposition of increasing these rates 15 per cent for the purpose of effecting the same measure of increase which is contemplated on interstate and intrastate traffic in the other eastern states referred to. Producers are planning to oppose this increase.

At a hearing before the State Commission in Columbus, Ohio, which was terminated the week ending August 20th, the railroads serving the State of Ohio offered to make the same reduction effective between points in that state as contemplated for Pennsylvania and West Virginia, but the producers declined to accept this basis as settlement of the proceedings before the State Commission, feeling that they were entitled to much greater relief than offered.

Southern District

In the Southern District the Southern Railway has under active consideration the question of establishing a mileage scale to supersede the present rates. While this mileage scale contemplates a few slight reductions, in many cases it means material advances and producers in that territory intend to make a vigorous fight against the establishment of this scale and for the promulgation of a much lower scale of rates which would reflect a more reasonable basis.

The Interstate Commerce Commission has overruled the Railroad and Public Utilities Commission of Tennessee and have ordered intrastate rates on sand, gravel, and crushed stone when used for road building to be increased 25%, the same as interstate rates and rates for commercial shipments which were made under Ex Parte 74.

Western and Mountain-Pacific District

In the Western District the State Commissions of Wisconsin, Oklahoma, and Montana have made reductions in the rates and negotiations are now pending before some of the other state commissions. In Nebraska the railroads, producers and the State Commission have agreed to a scale of rates which will grant temporary relief. In Arkansas the matter of rates on sand and gravel came up for a conference with the representatives of the Interstate Commerce Commission in Little Rock, September 13, 1921.

Downward Tendency Reassuring

It is gratifying that progress is being made in the way of securing a lower level of rates on sand, gravel and crushed stone, but care should be exercised by producers, in accepting these voluntary reductions, to stipulate that such acceptance does not prejudice their immediate future rights to negotiate individually or collectively for still greater reductions.

National Association Prepared to Render Assistance

With a complete file of freight tariffs on sand, gravel and crushed stone in this office, supplemented by the data which is available, the National Association offers its assistance and advice as far as possible in securing a lower level of rates. We think it important for producers and local associations to keep this office currently informed of negotiations as well as any action taken by the railroads and state commissions on all matters pertaining to rates on sand, gravel and crushed stone. This will enable the National Association to furnish valuable information at all times to its members, which will prove of great advantage in securing

the most favorable results from such negotiations.

Open-Top Car Supply

The newspapers report that the Interstate Commerce Commission fears that a too great resumption of business might precipitate a car shortage this fall, especially if there should develop a heavy movement of grain and coal. While it is true that the output of bituminous coal is exceedingly low for this time of the year, the weekly production being less than 7,750,000 tons, yet it is generally admitted that the demand for coal, except for domestic purposes, will not be increased materially until the steel mills are operating on a greater scale than at present. The steel mills will not likely become active unless the railroads begin buying and that will not take place until Congress passes the railway funding bill. It is not believed that this legislation will be enacted at the extra session.

According to a report of the American Railway Association, the number of idle open top cars, in good condition, on August 16 was 145,072 as compared with 162,623 for the previous two week period; that does not include the vast number of cars reported in bad order which could be used in an emergency. Though these figures indicate that the surplus of open top cars is gradually being absorbed, it is evident that it will require a very unusual condition to create a car shortage within the next four months.

E. GUY SUTTON,
Executive Secretary.

Washington, D. C., August 31, 1921.

The action of the railroads serving the States of Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and West Virginia in reducing rates on sand, gravel and crushed stone substituting an increase of 15% in lieu of 40% over the rates in effect during August, 1920, comes too late to stimulate building and construction work for this year, according to a statement issued September 13 by the National Association of Sand and Gravel Producers. Contracts for road work have been let and sufficient time is not allowed before cold weather sets in to start new building projects. The best that can be hoped for is that the limited reductions which the carriers are making will prove an incentive to stimulate the constructive industry for next year.

The reduction contemplated by the railroads amounts to only 18%, whereas freight rates on sand, gravel and crushed stone have been subjected to increases of 15% in April 1918; 20c per net ton in June, 1918, and 40% in August, 1920. These commodities have always been limited to short hauls in the Eastern Territory on account of high rates. The total increases which have been made in the rate applying between short haul points amount to 116% on a pre-war rate of 37c; 138% on a pre-war rate of 42c and 149% on a pre-war rate of 48c per ton, so that as compared with the increases which have been made the reduction now proposed of 18% is not sufficient to enable these commodities to move freely over the railroads.

Freight Rates on Rock Products Are Coming Down

Railways Beginning to Recognize Futility of Prohibitive Freight Rates as Income Producers

A SUMMARY of the transportation situation, as regards sand, gravel and crushed stone, up to August 30, is given elsewhere in a general letter of E. Guy Sutton, executive secretary of the National Association of Sand and Gravel Producers. Mention is made there of the reduction of approximately 18 per cent by the Eastern railways.

Up to the time this issue goes to press no decision had been rendered by the Ohio Public Utilities Commission in the case of the Highway Commission and the sand and gravel producers. The railways in a conference with the interested parties proffered a reduction of 18 per cent, which was rejected in the hope that the State Utilities Commission would order a greater reduction. It is understood that the chairman of the Central Freight Traffic Committee of the railways at Chicago is now offering all producers an 18 per cent reduction.

In Virginia the State Corporation Commission has ordered, effective at once, a flat reduction of 25 per cent in the existing rates on sand, gravel and crushed stone for highway work. The new rate, however, will expire by limitation on December 31, 1921. This action was taken with the co-operation of the railways and it is said will be applied by them to all these materials whether used in highway work or not. The Chesapeake & Ohio R. R. on August 22 reduced the rates on all building material 15 per cent.

In Indiana the big issue as to the jurisdiction of the State Public Service Commission is being fought out before the United States Supreme Court. R. C. Yeoman, of the Indiana Sand and Gravel Producers' Association, gives the following summary of the case to date:

The Indiana Rate Situation

"On January 28, 1921, the Interstate Commerce Commission declared in effect that the rates, fares and charges then in force, under an order of the Public Service Commission of Indiana, constituted an undue and unreasonable burden on interstate commerce. This referred to the order that allowed only 10% increase in freight rates instead of the 40% permissive under ex parte 74, and also effected rates on other freight and passenger fares in which the sand and gravel industry is not directly interested. The Interstate Commerce Commission in its order did not purport to find any one specific or individual rate a burden; in fact, as shown by the report, individual rates were not considered except in their relation to the general schedule of rates. The situation was viewed broadly as a general proposition and an increase (to 40%) ordered which was found by the Interstate Commerce Commission not to be a burden on interstate commerce.

"The Indiana rates were raised March 25, 1921. The Baltimore & Ohio Railroad Co. enjoined the Public Service Commission before Judge Anderson in the District Court of the United States to insure the carrying out of the order of the Interstate Commerce Commission. The injunction order was sweeping in its effect, taking away all the power of the Public Service Commission of Indiana over freight and passenger rates. The Interstate Commerce Commission has refused consistently to assume jurisdiction over rates purely intrastate; therefore, Indiana is left with no rate making authority for intrastate business. A motion was made by the defendants, the Public Service Commission of Indiana, to modify the order for interlocutary injunction. Following is a copy of the motion:

"The defendants move the court to modify the order for an interlocutory injunction heretofore entered in this cause by adding thereto the following:

"Third: Nothing contained in this order shall be construed as prohibiting the defendant, Public Service Commission of Indiana, from altering or changing any individual rates, fares or charges, authorized and prescribed in the said order of the Interstate Commerce Commission, dated January 28, 1921, nor from fixing and prescribing new in-

dividual rates, fares and charges or rates, fares and charges on specific commodities or specific classes of commodities between specified points within the State of Indiana where no such individual rates, fares or charges were authorized or prescribed in said order; nor as prohibiting any of the defendants from enforcing any order of the said defendant, Public Service Commission of Indiana, hereafter made, fixing and prescribing such individual rates, fares and charges so fixed and prescribed by the said defendant, Public Service Commission of Indiana, shall have been found and declared by the Interstate Commerce Commission to cause undue or unreasonable advantage, preference or prejudice as between persons or localities in intrastate commerce on the one hand, and interstate and foreign commerce on the other hand, or any undue or unreasonable or unjust discrimination against interstate or foreign commerce, and unless and until the said Interstate Commerce Commission has prescribed the rate, fare or charge, or the maximum or minimum thereafter to be charged."

"The granting of this motion would give the Public Service Commission authority to install new intrastate commodity rates where sixth class rates are now in force, and to adjust unreasonable intrastate rates where no unjust discrimination would be caused against interstate or foreign commerce. It would appear also that the Indiana Commission would have the right to adjust Indiana rates to the same level of rates in Michigan and Ohio without causing undue burden on interstate commerce."

The Southwest

In Mississippi the railways have agreed to the dismissal of the injunction suits against the State Railroad Commission and will accept a new schedule of rates. These are on a mileage scale, the original of which was published in full in Rock Products, July 30, page 21. However, this scale was subsequently modified by the Railroad Commission and the figures somewhat increased.

The new rates, which will go into effect October 1, are now on the same basis as the rates in effect in 1918 plus two 25% advances.

In Arkansas F. E. Brown of the Interstate Commerce Commission is sitting with the State Railroad Commission in a postponed hearing on the petition of railroad companies operating in Arkansas for a 35 per cent increase in the intrastate rates on sand and gravel. A decision will be made by the Interstate Commerce Commission later, as Mr. Brown's purpose is simply to complete the case.

The petition was filed in October of 1920 and the railroads, pending a decision, were restrained from putting the higher rates into effect. At the time the hearings were begun last year the railroads put in their testimony, and recently announced that they would offer no further evidence.

Railroads contend that the intrastate rates are lower than the interstate rates by about 35 per cent, and that the petition is for the purpose of adjusting discrepancy.

The petition is opposed by shippers, officials of the State Highway Department and engineers and other officials of highway districts. In his testimony rerecently George B. Marshall, engineer for the Northwestern Arkansas Improvement District, which is constructing a highway in Arkansas County, said that an increase in rates would make the road building material almost prohibitive for the sections to which it must be transported over any considerable distance. He said that in one year in his section the loss to farmers because of inadequate highway facilities was almost $2,000,000.

In Oklahoma the State Corporation Commission has won its case in the supreme court of the state. The court has upheld the commission's order for a reduced mileage scale of rates, to apply specifically to the Tulsa territory. This scale is 40 cents per ton for a 10-mile haul, increasing to 70 cents for 30 miles or more. In its decision the court said it "assumed" the same rates would apply under similar conditions to other localities in the state.

Oregon Reductions

On August 30 the Oregon State Public Service Commission issued an order at the instance of the State Highway Commission and interested producers, reducing freight rates on road-building materials from 5 per cent for short hauls to 33⅓ per cent for long hauls. The railways were given ten days to comply with the order.

Under the new schedule the rates for one-line hauls range from 40 cents per ton up to 10 miles, and $1.80 for 150 miles. For two-line hauls the rates range from $1 to $2, respectively. These rates were actually fixed, it is said by a joint conference between the commission, producers, and railway managements. They are about the same as the rates ordered some time ago by the Montana Railroad Commission.

Agricultural Limestone

The Illinois Central R. R. has taken the initiative in the matter of reducing freight rates on agricultural limestone. In Illinois the rates after the 40 per cent increase of 1920 were absolutely prohibitive and the railways had the experience of seeing this traffic entirely demolished.

The old and the new rates, announced by the Illinois Central and effective on all its lines by September 26, is as follows:

Mileage	Old Rate	New Rate
80	.84	.60
100	.98	.70
125	1.25	.80
150	1.40	.90
200	1.82	1.05
250	2.10	1.10
300	2.38	1.15
350	2.66	1.20

Cement Manufacturers Plead "Not Guilty"

AFTER FORTY-FOUR INDIVIDUALS and nineteen cement firms, through their attorneys, pleaded not guilty to violation of the Sherman Act by price fixing and conspiracy against free competition in the cement trade, in New York City on September 19, before Judge William V. Sheppard in the United States District Court, United States Attorney William Hayward took exception to the language of Archibald Cocks, spokesman for the lawyers representing the defendants.

While the lawyers and their clients were walking out of the court room Col. Hayward called the attention of Judge Sheppard to the statement of Mr. Cocks that "even though convicted their punishment would be merely a fine."

The statement, Col. Hayward said, was improper and unless corrected would give color to a later claim that the prosecutor, by silence, had given assent to such a disposition of the cases.

Judge Sheppard said the point was well taken and he wished the record to show there was no agreement as to sentence in the event of conviction.

Bail of $1,000 was furnished by each defendant.—New York "World."

American Road Builder's Association Next Convention

IN VIEW OF THE FACT that road building now forms the major part of the construction industry, the second largest industry in the United States, the announcement of the Board of Directors of the American Road Builders' Association, that its next annual convention and good roads show will be held in Chicago, Ill., on January 17, 18, 19 and 20, is of particular interest. More than one billion dollars is now available for highway work in this country and legislation now pending before Congress will undoubtedly be passed, adding many millions more to this account.

In addition to the papers and discussions on important highway problems by leading road builders of the country, the exhibition of road machinery will be an extremely valuable feature. During the past decade, road building methods have been revolutionized by the introduction of labor saving machinery. In 1919, the last year for which figures are available, more than $100,000,000 worth of road machinery was manufactured, according to the U. S. Department of Commerce. This is greater than the value of all other construction machinery produced in that year and shows the relative importance of the road building industry.

With the central location of Chicago, the immense amount of road money available and the increased interest in road matters, the directors of the association are of the opinion that the coming convention and show will surpass any previously held and that highway engineers, contractors and officials will attend in greater numbers than ever before.

Editorial Comment

Exit the Dinkey Plant

These have been—indeed still are—nerve-racking times for the commercial sand and gravel producer. He has seen his investment threatened and the whole industry somewhat disorganized by freight-rate increases which have made the use of his material practically prohibitive in many of his former markets. He has seen a host of new little competitors jump into the field to take advantage of his difficulties; and possibly his whole faith in the industry has been a little shaken.

But every cloud has its silver lining, and the silver lining of this particular cloud is beginning to show. The railways are beginning to come to terms. And contractors and engineers are relearning the old, old lesson that side-of-the-road stuff, while its first cost *may be* cheap, is a mighty expensive product in the long run.

There never was a product put on the market yet that did not win out in the long run on quality and service. Unfortunately the sand and gravel industry is so constituted that this fact requires new demonstration every five or six years. But now the sand and gravel industry is organized as never before to drive home just these facts; and therefore we confidently look forward to the present flivver in side-of-the-road plants to end much quicker and decisively than its predecessors.

It was gratifying to learn during the past week that a very large Middle West sand and gravel producer is going ahead full speed on two big new projects, which to our mind is the best possible proof that the day is close at hand when the railways and the commercial sand and gravel producers will be working together again in peace and harmony.

It was also gratifying to receive the letters we have about the September 10 issue, of which the following is typical—and illustrates, we believe, a typical condition in the industry:

> The writer has just read your editorial in the Sept. 10th issue on page 52, and let us say right here that that is one of the best editorials that we have read on such a subject for many a year; and we wanted to write you and let you know we appreciate it.
>
> We are especially appreciative at this particular time as we are right on the point of going into the sand and gravel business once more. Up to 1911 we were in the game here in —— in the old-fashioned way, with hand screens and horse drawn tip-carts; but competition became keen and we realized that we could not compete with men who did not know what it cost them to do business.
>
> The sand and gravel deposits within the city limits are about exhausted or will be within two years and the contractors have been having greater trouble every year in getting good sand in sufficient quantities. We have therefore bought a tract of some one hundred and fifty acres of exceptionally good sand; sharp and very clean, and we are planning to put up a modern plant.

Open-Price Competition

Cement manufacturers in the Eastern States have been served with supplementary indictments charging them with further violation of the Sherman law through the operations of the Cement Manufacturers' Protective Association. The new indictments merely amplify those previously reported except that the second count of this new indictment is so drawn as to test the question of whether the mere adoption of the Eddy "open-price plan" of competition does not constitute a contract in restraint of trade under the Sherman law.

A great many associations in the rock products field would be interested in seeing this point thoroughly tested.

The attorney general of Missouri seems to have viewed the thing in a sane way. He is quoted as having reported:

> This department has completed its examination of the 2300 pages of testimony taken at the Kansas City building trades wage conference. The evidence shows that in several branches of building materials there exist associations which maintain a modification of what is known as the "open price" plan. They are the Missouri Valley Sand and Gravel Producers' Association, the Norcross Audit and Statistical Bureau maintained by the cement companies, the Kansas City Lumber Trade Exchange and the Manufacturers of Common Brick Association. These associations exchange information as to selling prices and maintain virtually the same plan of organization as that used in St. Louis, where the Attorney General has instituted suits against three associations comprising over 100 defendants.
>
> The form of the association, however, is only incidental, and if used in a proper manner does not necessitate State intervention. The "open price" plan lends itself very readily to the fixing of prices where the plan is accompanied by unfair prices and apparent restrictions of trade, prosecution is justified and will quickly follow. In other words, the State does not wish to unsettle business conditions or interfere with established business practices unless those practices are directly harmful to the public.
>
> In St. Louis scores of complaints came from individuals as well as a formal complaint from the Building Trades Council, and a request for an investigation from the Chamber of Commerce. The newspapers made exhaustive investigations and furnished considerable information.
>
> The conclusion is, therefore, that while there exist in the hands of these associations, the instrumentalities for the convenient violation of the anti-trust laws, no offense is committed until those instrumentalities are so used, and that there are before us no communications containing complaints that the laws have been violated or prices maintained by agreement in Kansas City. If those charges are made, they will receive early investigation.

Lime on the Map

A year ago this time ROCK PRODUCTS took occasion to criticise the lime industry for its failure to take advantage of the National Exposition of the Chemical Industries to drive home to industrial chemists and the general public, the importance of lime as a basic chemical. Now let us extend our heartiest congratulations to the National Lime Association for the splendid way in which that message was put across this year.

Accident Prevention

Fire Extinguishment

Prepared by the Engineering Department of the National Safety Council.

CARBON TETRACHLORIDE when heated to about 200 deg. F. is transformed into a gas heavier than air. When thrown on a fire the gas surrounds the fire area, keeping out the air and oxygen, and tends to smother the fire. As the extinguishing value of carbon tetrachloride depends on the smothering effect of the gas, these extinguishers are of little value where there is a wind or other air current which will carry the gas away from the fire. A fire in freely-burning material, such as wood or paper, quickly creates a strong draft of air inward and upward, and such fires are difficult to extinguish with carbon tetrachloride except when they are very small. This type of extinguisher is useful, however, for reaching fires in partitions and other concealed spaces.

Extinguishers containing this fluid are of particular value for electric fires, as the carbon tetrachloride is a non-conductor of electricity and will not injure electrical apparatus. The stream may be directed on the commutator of a dynamo without danger to operator or dynamo. Carbon tetrachloride extinguishers are recommended for all electric cranes, at motors (wherever located), and at convenient points in power houses.

Carbon tetrachloride does not deteriorate with age, nor freeze at usual temperatures, and if mixed with a small per cent of certain other ingredients will withstand a temperature of 50 degrees below zero.

Although there is question whether or not the gas itself is harmful, there are instances where persons have been overcome while using the extinguishers.

Carbon tetrachloride extinguishers should be tested periodically to see that the pump has not gummed, which would interfere with its free action. It is suggested that twice each year all extinguishers be tested by discharging (by pumping) all the contents into a pail. The pump should then be operated vigorously to make sure that it works freely, and that the packing is flexible. Then the fluid should be replaced, a little being added to fill the tank. Particular care must be taken that no water becomes mixed with carbon tetrachloride used in extinguishers, as water will reduce its non-conductivity.

Sawdust and Soda

A mixture of sawdust and bicarbonate of soda (about 10 pounds of soda to a bushel of sawdust) is a valuable extinguishing agent in fires of inflammable liquids. This mixture floats on the surface of the burning liquid, shutting off the oxygen supply and smothering the fire. It is much more effective than sand in putting out fires of inflammable liquids. Unless foam extinguishers are provided, a supply of sawdust and soda should be kept on hand at all containers of varnishes, lacquers, oils, paints, and similar liquids. The principal point in its favor is its low cost.

23,175

Men Saved from Death or Serious Injury by One Company in Twelve Years!

THIS GIGANTIC SAVING in men effected by one concern practicing Safe methods in manufacturing represents a saving in dollars that is stupendous.

With them accident prevention is an "operating department" which pays dividends at the rate of about one million dollars annually.

What they have done—you can do. Your actual savings in dollars would be smaller perhaps, but your percentage of saving would be the same. Accident hazards throughout like industries are constant factors.

This company was one of the pioneers in the Safety Movement—one of the organizers and a charter member of the National Safety Council.

Today the National Safety Council offers you the accumulative experience of this concern and four thousand others. And in addition, an educational and news service that is setting the pace for accident prevention activity the world over.

Write today for details on membership.

National Safety Council

Co-operative—Non-Commercial

168 North Michigan Avenue, Chicago, Ill.

Suggestions

The efficiency of fire-fighting apparatus depends largely upon its proper use. Unless the hose stream, the extinguishing fluid, sand, or sawdust is directed on the base of the fire, its value is lost. Employees should be instructed in the proper use of all equipment, and given an occasional opportunity of seeing it in actual operation.

Fire extinguishers and fire hose racks are sometimes found inaccessible on account of material stacked in front of them. It is also a fact that the employees in many plants do not know where the fire apparatus is located. To be of value such apparatus must be put into use immediately after fire is discovered. It should, therefore, be placed prominently and kept easily accessible—if not it might as well not be provided at all. Some plants place extinguishers along center aisles with a red mark on floor or around column or post on which extinguisher is hung, and often with a red light over it at night.

Inspection should be made of all fire-fighting apparatus including extinguishers, fire barrels and pails, hose, hydrants, and valves, at least once each week. Many of the large companies require such an inspection every day. A competent man should be assigned to this inspection service and should periodically make a complete and detailed inspection of all apparatus and equipment, keeping a record of the inspection on a blank for that purpose.

Purposes of inspection are to determine (a) what possibilities of fire outbreak can be eliminated, (b) fire-fighting equipment and apparatus is in good condition and accessible.

It has often been the case that extinguishers were found empty when most needed. In order to know at a glance whether an extinguisher has been tampered with, through mischief or maliciously, some companies use a car seal to fasten handle of extinguisher to hanger bracket. These seals are easily broken, and therefore do not interfere with use of the extinguisher. They are, however, not replaceable and hence enable the inspector to know whether extinguishers have been disturbed for any reason.

Cave-Ins at Sand and Gravel Operations

TWO RECENT FATAL ACCIDENTS at sand and gravel pits point to the ever present danger of cave-ins. One of these accidents occurred at the pit of the Northern Indiana Gravel Co., Wolcottville, Ind., and the other at the operation of the Gallup Sand and Gravel Co., Boonville, Ky.

In the first case 15 men were working in the pit, three were killed and a fourth probably fatally injured. In the second case only two men were caught, one of whom was killed, the other being rescued before he was entirely buried.

These four fatalities, all within a week, show the need for more attention to accident prevention at commercial sand and gravel plants, not only for humanitarian considerations, but because these fatalities will be directly reflected in the rates other operators must pay for their compensation insurance.

Freight Rates and Limestone

High Rates in New York State Are Preventing an Annual Consumption of Four Million Tons

THE RAILROADS have prepared many carefully figured briefs to prove that freight rates are not the cause of high prices to the consumer and a handicap to farmers. There are two sides to every question, but rates now charged for agricultural limestone are such that the farmer is unable to use this bulky, low grade product, even if it is essential to guarantee the productivity of his soil.

The situation has become especially acute in New York State and farm leaders are seeking co-operation of railroads in the state in securing lower rates. It was pointed out more than a year ago that only 18 per cent of the productive soil of the state *did not* need liming.

Soil specialists of the state college of agriculture and the state experiment station report that at present costs of limestone the soil of the state is not being treated. That means that just about 2,340,000 acres of the improved farm land in the state does not need liming and that about 10,660,000 acres that do need liming are not getting it.

Figures used by agricultural specialists at a conference on limestone rates between officials of the railroads and farm leaders recently were quoted to show that one large limestone manufacturer sold 1,734 cars of lime from January 1 to August 1. In the same period in the previous year he sold 2,593 cars.

The fact that farmers will buy limestone and use it if rates are not excessive was indicated by statistics furnished by a company doing the bulk of the limestone business in New York State. The normal April shipments of the company into the State amount to about 6,000 tons. In April, 1921, immediately after state farm bureau officials had secured a readjustment of rates, total shipments were 7,882 tons, a gain of 1,882 tons. The gain in revenue amounted to $3,952.20.

The same company furnished figures to show the slump in orders received from New York State farmers this fall was due largely to high freight rates, although agricultural depression had some effect upon the situation. Unfilled orders on hand for July and August shipments in 1920 amounted to 381 cars; in 1921 to only 28 cars. Orders for limestone received from New York State farmers June 1 to July 10, 1920, amounted to 405 cars; in 1921 to 60 cars.

This slump occurred despite the fact that this large company put on more salesmen, had more agents, and covered more territory than in previous years. It was also the normal season for farmers to order limestone for fall use on winter grains.

Freight rates on limestone per acre, figuring one ton to the acre, are extremely high when compared with fertilizer costs. Limestone rates vary from $1.50 (per ton) per acre for short hauls to $3.64 on long hauls. Compare this with 50 to 75 cents per acre for fertilizer. Also limestone is applied at the rate of one to two tons per acre; and fertilizer at from 200 to 300 lbs. per acre.

A questionnaire sent out to farmers recently by the farm bureau secured an estimate that 18,000,000 tons of limestone were needed for use in New York State, or an annual application of from four to five million tons per year. Limestone is vitally needed, according to experts, to secure not only sweet soils, but also to secure full benefits from the use of fertilizers, acid phosphates and potash salts especially.

These figures, letters from actual farmers, and other data have been compiled to prove to railroads that cheaper rates on limestone would not only prove beneficial to farmers, but also to the railroads themselves. Farm experts have pointed out that increased use of limestone will mean increased use of cars by farmers later as production will naturally be heavier. It is shown that limestone rates are closely connected with the yield per acre in figuring a farmer's profits from his crops.

It is probable that the situation is not as acute in other states as it is in New York, but it is more than probable that a reduction in limestone freight rates would result in increased use and greater yields of farm products in many sections of the country. This, in turn, will mean increased revenue to railroads in harvest time, when fuller crops come into the market.

(The article elsewhere in this issue on rock products freight rates tells how one railway in Illinois has already met a similar situation.—Editor.)

Superior Portland Cement Plant Breaks Record

SHIPMENTS of portland cement from the plant of the Superior Portland Cement Co., Concrete, Wash., during the month of August totaled 123,000 barrels, the largest for any month in the history of the plant. The best previous month was that of June, 1920, when 121,000 barrels were shipped out. Orders now on hand indicate that shipments for September will be considerably in excess of those for the same month last year, although the mark set last month may not be reached. Total shipments for the season are a little under those for the same period of 1920, but it is believed that by the end of the season the shipments for 1921 will equal or exceed those for 1920.

The company is still busy with new construction in connection with the plant, and new improvements are always being added to increase the capacity of the plant and lower operating expenses. A huge rock storage bin has recently been installed, with a capacity of about 25,000 tons of rock, eliminating all delays on account of shortage of rock during the rush season. A secondary crusher is now being built at the quarry to expedite the work at that end of the operation. The local plant is now one of the largest and most modern in the country, and if the present rate of improvement is kept up it will only be a short time until it will rank with the largest.

Southwestern Portland Cement Company to Build New Plant in Texas

WACO, TEX.—Members of the industrial committee of the Waco Chamber of Commerce who have been conducting the negotiations announced September 5 that instructions have been received from the Southwestern Portland Cement Co. to close the deal for 258 acres of land, half a mile northwest of the city limits at a cost of $51,600. The land was bought from Mrs. Eddie Kendrick of Waco and it follows an investigation of the property made by the president of the company, C. Leonardt of Los Angeles, who found extensive deposits of lime rock. An option was taken on the property, which was formally purchased September 5.

It is the intention of the Southwestern Portland Cement Co., according to advices received here, to erect a big cement plant on the land which the company now owns here and the total cost of the improvements is expected to aggregate approximately $3,000,000. The Southwestern Portland Cement Co. now operates two plants in the United States, one of the biggest of which is located at El Paso.

The ground bought September 5 for the cement plant here is a part of the tract of 600 acres formerly occupied by Rich field.

Gypsum Plaster Board Exports

DURING 1920, according to figures compiled by the United States Geological Survey, gypsum plaster and gypsum wall board to the value of over $1,500,000 was exported. The Britsh Isles were the largest buyers, the total amounting to nearly half a million dollars.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Blakeslee, N. Y.	1.00	1.00	1.00	1.00	1.00	1.00
Buffalo, N. Y.	1.30 per net ton, all sizes					
Burlington, Vt.	1.00	.....	2.50	2.00	2.00	.....
Chaumont, N. Y.	1.00	.....	1.75	1.25	1.25	1.25
Cobleskill, N. Y.	1.25	1.25	1.25	1.25	1.25	.....
Coldwater, N. Y.	1.50 per net ton, all sizes					
Eastern New York	.90	1.80	1.70	1.60	1.60	1.50
Eastern Penna.	1.00	.....	1.60	1.60	1.60	1.60
Munns, N. Y.	1.00	1.50	1.50	1.25	1.25	1.25
Walford, Pa.	1.00	.....	1.60	1.60	1.60	1.60
Western New York	.70	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alden, Ia.	.80@1.00	.80@1.00	1.50	1.45	.....	.....
Alton, Ill.	2.00	.....	1.50	1.40	1.35	.....
Bettendorf, Ia.	All sizes, 2.00 cu. yd. f.o.b. quarry					
Buffalo, Iowa	1.00	1.30	1.40	1.20	1.25	1.30
Chicago, Ill.	1.00	1.40	1.00	1.00	1.00	1.00
Columbia, Ill.	2.15	1.90	2.00	2.00	1.90	1.90
Dundas, Ont.	1.00	1.50	1.50	1.50	1.25	1.20
Eden and Knowles, Wis.	1.30	1.30	1.30	1.30	1.30	.....
Greencastle, Ind.	1.25@1.35	1.25	1.10	1.10	1.10	1.10
Illinois, Southern	1.75	1.60	1.50	1.50	1.40	.....
Kokomo, Ind.	1.10	1.25	1.25	1.10	1.10	1.10
Krause or Columbia, Ill.	1.60	1.30	1.30	1.30	1.30	1.30
Lannon, Wis.	.90	1.00	1.00	1.00	1.00	1.00
Marblehead and Brillion, Wis.	1.10	.....	1.20	1.10	1.10	.....
Montrose, Ia.	1.35@1.50	1.50	1.50@1.60	1.50	1.50	1.50
Oshkosh, Wis.	1.40 per ton, all sizes					
Sheboygan, Wis.	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10	1.05@1.10
Southern, Illinois	1.75	1.60	1.50	1.50	1.50	.....
Stolle, Ill. (I. C. R. R.)	1.75	1.60	1.60	1.50	1.50	1.50
Stone City, Iowa	.50	.....	1.40	1.35	1.30	.....
Toledo, Ohio	1.84	1.99	1.99	1.99	1.84	1.84
Toronto, Canada	1.90	2.40	2.40	2.40	2.15	2.10
Valmeyer, Ill.	1.60	1.30	1.30	1.30	1.30	1.30
SOUTHERN:	These prices include 90c freight					
Cartersville, Ga.	.....	2.00	.....	1.25	1.25	.....
Chickamauga, Tenn.	1.10	1.00	.....	1.00	.93	.....
El Paso, Tex.	1.00	1.00	1.00	1.00	1.00	.....
Fort Springs, W. Va.	1.40	1.65	2.00	1.70	1.50	1.40
Garnet and Tulsa, Okla.	.50	1.60	1.60	1.45	1.45	.....
Ladds, Ga.	1.50	.....	.....	1.25	1.25	1.25
Morris Spur (near Dallas) Tex.	1.10	1.25	1.25	1.25	1.25	1.25
Portland, Ga.	.60@1.00	(All other sizes 1.00@1.25)				
WESTERN:						
Atchison, Kans.	.50	2.10 (Rip-rap.	2.10	2.10 1.80 per ton)	2.10	2.10
Blue Springs and Wymore, Neb.	.20	1.65	1.60	1.55	1.45	1.40
Bromide, Okla.	.60	1.50	1.50	1.50	1.30	1.30
Cape Girardeau, Mo.	1.50	.....	1.50	1.50	1.25	.....
Kansas City, Mo.	1.00	2.00	2.00	2.00	2.00	2.00

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Baltimore, Md.	1.25	2.50	2.35	2.25	2.00@2.25	2.00
Bernardsville, N. J.	2.00	2.20	2.00	1.80	1.50	.....
Branford, Conn.	.60	1.50	1.50	1.25	1.10	.....
Bound Brook, N. J.	2.00	2.30	2.00	1.70	1.60	.....
Dresser Jct., Wis.	1.00	2.45	2.45	2.30	2.00	.....
Duluth, Minn.	.90@1.00	2.25	1.90@2.00	1.50	1.30@1.50	.....
Dwight Station, Calif.	.75@1.00—all sizes					
E. Summit, N. J.	2.10	2.35	2.15	1.75	1.75	.....
Eastern Mass.	.60	1.95	1.75	1.50	1.50	1.50
Eastern New York	.90	1.80	1.70	1.60	1.60	1.50
Eastern Penna.	1.60	2.25	1.95	1.80	1.80	1.70
New Britain, Middlefield, Rocky Hill, Meriden, Conn.	.60@ .80	1.60@1.75	1.50	1.25	1.10	.....
Oakland, Calif.	1.75	1.75	1.75	1.50	1.50	1.50
Richmond, Calif.	.50*	.....	1.75*	1.50*	1.50*	.....
San Diego, Calif.	.50@ .70	1.45@1.75	1.40@1.70	1.30@1.60	1.25@1.55	1.25@1.55
Springfield, N. J.	2.00	2.40	2.10	1.80	1.75	1.75
Westfield, Mass.	.60	1.35	1.30	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Alexandria Bay, N. Y.	1.60	.....	1.30	1.50	1.20	.....
Berlin, Wis.	1.60	.....	1.40	1.50	1.30	.....
Columbia, S. C.—Granite	.75	.....	2.75	2.50	2.35	.....
Dell Rapids, S. D.	1.00	.....	2.10	2.10	2.10	.....
Dundas, Ont.—Flint	1.00	1.50	1.50	1.50	1.25	1.20
Eastern Penna.—Sandstone	1.10	2.00	2.00	1.70	1.70	1.70
Eastern Penna.—Quartzite	.90	1.80	1.55	1.30	1.30	1.10
Holton, Ga.—Granite	.40	.....	2.50	2.25	2.25	2.00
Lohrville, Wis.	1.60	.....	1.30	1.50	1.20	.....
Los Angeles, Cal.—Granite	.....	1.25@1.50	1.15@1.40	1.15@1.40	.....	.....
Macon, Ga.—Granite	.50	.....	2.50	2.25	2.00	2.00
Middlebrook, Mo.—Granite	3.50@4.00	.....	.....	2.00@2.25	.....	1.25@1.75
Red Granite, Wis.	1.60	.....	1.30	1.50	1.20	.....
Sioux Falls, S. D.	1.00	.....	2.00	2.10	2.00	.....
Stockbridge, Ga.—Granite	.50	2 00	1.90	1.75	1.75	.....
Utley, Wis.	1.60	.....	1.30	1.50	1.20	.....

*Cubic yard. †Agrl. lime. ||R. R. ballast. §Flux ‡Rip-rap. a 3-inch and less.

Agricultural Limestone

EASTERN:

Chaumont, N. Y. — Analysis, 95% $CaCO_3$, 1.14% $MgCO_3$ — Thru 100 mesh; sacks, 4.50; bulk 2.75

Coldwater, N. Y.—Analysis, 56.77% $CaCO_3$, 41.74% $MgCO_3$, 70% thru 200 mesh, 95% thru 50 mesh, sacks 4.00; bulk 3.00

Grove City, Pa. — Analysis, 94.75% $CaCO_3$, 1.20% $MgCO_3$ — 70% thru 100 mesh; 80 lb. ppr., 5.50; bulk 4.50

Hillsville, Pa.—70% thru 100 mesh; sacks, 4.75; bulk 3.00

Jamesville, N. Y. — Analysis, 89.25% $CaCO_3$, 5.25% $MgCO_3$; sacks, 4.50; bulk 2.75

New Castle, Pa.—89% $CaCO_3$, 1.4% $MgCO_3$—75% thru 100 mesh, 84% thru 50 mesh, 100% thru 10 mesh; sacks, 4.75; bulk 3.00

Texas, Md.—Analysis, 58.02% $CaCO_3$, 37.3% $MgCO_3$—50% thru 50 mesh; bags, 4.25; bulk 2.50

Waltord, Pa. — 50% thru 100 mesh, 60% thru 50 mesh, 100% thru 10 mesh; sacks, 4.75; bulk 3.00

West Stockbridge, Mass., Danbury, Conn., North Pownal, Vt.—Analysis, 90% $CaCO_3$—50% thru 100 mesh; paper bags, 5.00—cloth, 5.25; bulk .. 3.50

Williamsport, Pa. — Analysis, 88-90% $CaCO_3$, 3-4% $MgCO_3$—50% thru 50 mesh; paper, 5.50; bulk 4.00

CENTRAL:

Alden, Ia.—Analysis, 99.16% $CaCO_3$.... .80

Alton, Ill. — Analysis, 96% $CaCO_3$, 0.3% $MgCO_3$—50% thru 4 mes..... 4.50

Bedford, Ind. — Analysis, 98.5% $CaCO_3$, .5% $MgCO_3$—90% thru 10 mesh ..... 1.60@2.00

Belleville, Ont. — Analysis, 90.9% $CaCO_3$, 1.15% $MgCO_3$—45% to 50% thru 100 mesh, 61% to 70% thru 50 mesh; bulk 2.50

Bettendorf, Ia.—Analysis, 96.14% $CaCO_3$, 2.5% $MgCO_3$—50% thru 100 mesh, 2.00; 50% thru 4 mesh..... 2.00

Buffalo, Ia.—90% thru 4 mesh..... 1.00

Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.3% $MgCO_3$ (90% thru 50 mesh, 2.00), 50% thru 4 mesh..... 1.50

Chicago, Ill.—Analysis, 53.63% $CaCO_3$, 37.51% $MgCO_3$—90% thru 4 mesh.... 1.50

Columbia, Ill., near East St. Louis—½-in. down ..... 1.25@1.80

Detroit, Mich.—Analysis, 88% $CaCO_3$, 7% $MgCO_3$—75% thru 200 mesh, 2.50@4.75—60% thru 100 mesh..... 1.80@3.80

Elmhurst, Ill. — Analysis, 35.73% $CaCO_3$,, 20.69% $MgCO_3$—50% thru 50 mesh 1.25

Greencastle, Ind. — Analysis, 98% $CaCO_3$—50% thru 50 mesh..... 2.00

Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$—90% thru 50 mesh.. 2.00

Marblehead, O.—Analysis, 33.42% $CaCO_3$, 4.29% $MgCO_3$—52.4% thru 100 mesh, 59.4% thru 50 mesh, 100% thru 10 mesh; sacks, 4.75; bulk..... 3.00

Limestone screenings; bulk..... 1.50

McCook, Ill.—Analysis, 54.10% $CaCO_3$, 45.04% $MgCO_3$—100% thru ¼-in. sieve, 78.12% thru No. 10, 53.29% thru No. 20, 38.14% thru No. 30, 34.86% thru No. 50, 22% thru 100 1.50

Milltown, Ind. — Analysis, 93.10% $CaCO_3$, 3.2% $MgCO_3$—33.6% thru 100 mesh, 40% thru 100 mesh..... 1.50@1.65

Mitchell, Ind.—50% thru 100 mesh..... 2.00

Montrose, Ia.—⅛-in. ..... 1.35@1.50

Ohio (different points), 20% thru 100 mesh; bulk ..... 1.25@1.50

Piqua, O. — Analysis, 82.8% $CaCO_3$, 8.2% $MgCO_3$; neutralizing power in terms of calcium carbonate, 95.3%—50% thru 100 mesh..... 3.25@5.00

50% thru 50 mesh..... 1.75@2.00

Ridgeville, Ind.—Analysis, 98% $CaCO_3$ 100% thru 4 mesh..... 1.75

River Rouge, Mich. — Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk..... .80@1.40

Stolle, Ill., near East St. Louis on I. C. R. R. — Thru ¼-in. mesh — Analysis, 89.61% to 89.91% $CaCO_3$, 3.82% $MgCO_3$ 1.75

Stone City, Ia.—Analysis, 98% $CaCO_3$ 50% thru 100 mesh..... .50

Toledo, Ohio—¼-in. to dust, 20% thru 100 mesh 1.50

(Continued on next page)

Agricultural Limestone

(Continued from preceding page.)

Whitehill, Ill.—Analysis, 97.12% $CaCO_3$, 2.50% $MgCO_3$—90% thru 100 mesh 5.00
50% thru 100 mesh..... 1.75
Yellow Springs, Ohio—Aanlysis 96.08% $CaCO_3$, 63% $MgCO_3$, 32% thru 100 mesh; 95.57%, sacked, 6.00; bulk.... 4.25
SOUTHERN:
Barber, Va.—Analysis, 92 to 98% $CaCO_3$—Bags, 6.50; bulk..... 4.50
Blowers, Fla.—Analysis, 98% combined carbonates—75% thru 200 mesh..... 4.75
Cartersville, Ga.—Analysis, 96% combined carbonates—pulverized limestone ..... 1.75@2.00
Claremont, Va. (Marlime)—Analysis, 90% $CaCO_3$, 2% $MgCO_3$—(90% thru 100 mesh, $4.00), 50% thru 100 mesh 3.50
Dittlinger, Tex.—Analysis, 99.09% $CaCO_3$, .04% $MgCO_3$—90% thru 100 mesh ..... 2.00@3.00
90% thru 4 mesh ..... 1.00@2.00
Grovania, Ga.—Analysis, 95% $CaCO_3$, no $MgCO_3$—50% thru 100 mesh..... 2.50
Knoxville, Tenn.—Pulverized 2.50
90% thru 100 mesh..... 2.00
90% thru 50 mesh..... 1.50
Ladds, Ga.—Pulverized limestone..... 2.50
Linnville Falls, N. C.—Analysis,, 53% $CaCO_3$; 42% $MgCO_3$—50% thru 100 mesh; sacks, 4.50; bulk..... 3.00
Mascot, Tenn.—Analysis 52% $CaCO_3$, 38% $MgCO_3$.
80% thru 100 mesh..... 3.00
All thru 10 mesh..... 2.50
80% thru 200 mesh..... 4.50
Paper bags, $1.50 extra per ton; burlap, $2.00 extra per ton.
Maxwell, Va. 2.50
Ocala, Fla.—Analysis, 98% $CaCO_3$—75% thru 200 mesh..... 4.50
WESTERN:
Colton, Calif.—Analysis, 95% $CaCO_3$, 1½% $MgCO_3$—all to pass 14 mesh; bags, 6.50; bulk 5.50
Sacks, 15c extra, returnable.
Garnett, Okla.—Analysis, 86% $CaCO_3$, 50% thru 4 mesh ..... .50
Kansas City, Mo., Corrigan Sid'g—50% thru 100 mesh; bulk..... 2.00
Terminus, Calif.—Analysis, 96.2% $CaCO_3$, .04% $MgCO_3$—60% thru 200 mesh, 90% thru 100 mesh, 95% thru 50 mesh, 100% thru 4 mesh; sacks, 6.00; bulk 5.25
Tulsa, Okla.—90% thru 4 mesh..... .50

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated.

GLASS SAND:

Baltimore, Md. ..... 2.25@2.75
Berkley Springs, W. Va..... 2.00@2.25
Cedarville and South Vineland, N. J..... 2.00
Cheshire, Mass. ..... 5.00@7.00
Hancock, Md.—Damp ..... 2.50@3.50
Klondike and Pacific, Mo..... 2.00@2.50
Mapleton, Pa.—Dry 2.50
Damp 2.00
Massillon, Ohio 3.00
Millington, Ill. 1.75
Mineral Ridge, Ohio 3.00
Montoursville, Pa.—Green, washed..... 1.50@2.00
Oregon, Ill.—Large contracts..... 1.75
Ottawa, Ill. ..... 1.25@2.25
Pittsburgh, Pa.—Dry, 4.00; damp..... 3.00
Rockwood, Mich. ..... 3.00@3.50
Round Top, Md.—Damp..... 1.60@1.75
St. Mary's, Pa.—Unwashed..... 2.25
Thayers, Pa.—Washed 2.50
Unwashed 2.00
Utica, Ill. ..... 1.25@1.75
Zanesville, Ohio 2.50

FOUNDRY SAND:

Albany, N. Y.—Sand blast..... 4.50
Molding fine, coarse and brass..... 1.90@2.00
Allentown, Pa.—Molding coarse & fine 1.50@1.75
Arenzville, Ill.—Molding fine..... 1.40@1.60
Beach City, O.—Core, washed and screened ..... 2.00@2.50
Furnace lining ..... 2.50@3.00
Molding fine and coarse..... 2.25@2.50
Bowmantown, Pa.—Core ..... 1.35@1.50
Molding, coarse ..... 1.80@2.00
Cleveland, O.—Molding coarse..... 1.50@2.00
Brass molding ..... 1.50@2.00
Molding fine ..... 1.50@2.25
Core ..... 1.25@1.50
Columbus, O.—Core ..... .40@1.25
Sand blast ..... 3.50@4.50
Furnace Lining 2.00
Molding fine ..... 1.50@2.25
Molding coarse ..... 1.50@2.25
Stone sawing 1.50
Traction ..... .40@ .75
Brass molding 2.50
Conneaut, O.—Molding fine ..... 2.25@2.50
Molding coarse ..... 2.00@2.25

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
EASTERN:						
Attica, N. Y.	.75	.75	.75	1.00	1.00	1.00
Buffalo, N. Y.	1.10	.95			.85	
East Hartford, Conn.			.75 per cu. yd.			
Erie, Pa.		1.00		1.15		1.75
Farmingdale, N. J.	.48	.48	1.65	1.65	1.40	
Hartford, Conn.	.90		1.25	1.15	1.15	1.15
Leeds Junction, Me.		.60@ .75	2.00	1.75	1.65	1.50
Ludlow, Mass.	.75•	.75•	1.70		1.50•	1.50•
Philadelphia, Pa.	.75	.75		1.40	1.25	
Pittsburgh, Pa.		1.30	1.30	1.30	.85	.85
Portland, Maine		.50	1.75		1.35	1.35
Texas, Md.		1.00		Pure white sand, 1.50		
Washington, D. C.	.60@ .75	.60@ .75	2.00	1.40	1.20	1.20
CENTRAL:						
Alton, Ill.		.85				
Anson, Wis.	.50	.50		1.00		.90
Attica and Covington, Ind.	.90	.90	.90	1.00	1.00	1.00
Barton, Wis.		.60	.70	.70	.70	.70
Beloit, Wis.		.60	.60		.60	
Chicago, Ill.		1.75@2.23	1.75@2.43			
Cincinnati, Ohio	.70	.65	.90	.90	.90	.90
Columbus, O.	.90	.90@1.25	.90@1.25	.90@1.25	.90@1.25	.90@1.25
Des Moines, Ia.		.50@ .65	1.60	1.60	1.60	1.60
Detroit, Mich.	.65	.65	.95	.95	.95	.95
Earlestead (Flint), Mich.	.70		60-40 sieves, .85; Pebbles, .95			
Eau Claire, Wis.	.50	.50	1.00@1.25	1.00	1.00	
Elgin, Ill.		.80	1.00	.80	.80	.80
Elkhart Lake, Wis.	.70	.58	.90	.90	.72	.72
Ft. Dodge, Ia.		1.22		2.17		
Grand Rapids, Mich.		.50		.83	.77	.77
Greenville, Mechanicsburg, O.	.80	.70	.80	1.00	.85	.80
Indianapolis, Ind.	.60	.60		1.50	.75@1.00	.75@1.00
Janesville, Wis.		.65@ .75			.65@ .75	
Le Mars, and Doon, Ia.		.90		1.80		
Libertyville, Ill.		.75			.75	
Lincoln, Neb.		Sand .40, sand and gravel .80, drained for shipment				
Mankato, Minn.	.45	.45	.65	.65	.65	.65
Mason City, Ia.	.90	.80	1.90	1.80	1.70	1.65
Milwaukee, Wis.	1.15	1.15	1.25	1.25	1.25	1.25
Minneapolis, Minn.	.35@ .50	.35@ .50	1.50	1.50	1.50	1.25@1.50
Moline, Ill.	.50@ .70	.50@ .70	1.10@1.30	1.20	1.20	1.20
Oxford, Mich.		.37		.85	.80	
Riton, Wis.		.40			.60	.60
St. Louis, Mo., f. o. b. cars	1.40	1.55	1.60	1.40		1.35
St. Louis, Mo., delivered on job		2.40@2.55	2.60	2.40	2.40	2.35
Summit Grove, Clinton, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.75	.85	.85	.75	.75
Winona, Minn.	.60	.50	1.75	1.50	1.25	1.25
Yorkville, Moronts, Oregon and Sheridan, Ill.		.60@ .80	.70@ .80	.70@ .80	.70@ .80	.60@ .80
SOUTHERN:						
Alexandria, La.	.60@ .80					1.20@1.50
Birmingham, Ala.	1.48		all gravel—1.88			
Charleston, W. Va.			(Sand, 1.40@1.50; gravel, 1.50			
Estelle Springs, Tenn.	1.25	1.25	1.00	1.00	.90	.85
Ft. Worth, Tex.		2.00		2.00		2.06
Jackson's Lake, Ala.	.40@ .60	.50@ .60	.40@1.60		.50@1.00	.50
Jedburg, Mo.		1.05	1.20	1.00	1.00	.95
Knoxville, Tenn.	1.15	1.15	2.12		1.92	1.74
Lake Weir, Fla.		.75				
Macon, Ga.		.50@ .75				
Memphis, Tenn.	1.12	1.12				1.95
N. Martinsville, W. Va.	1.10	1.10		1.30		.90
New Orleans, La.	1.00		1.75		1.25	
Pine Bluff, Ark.	1.00@1.25	.80@1.05	Washed gravel, all sizes, 2.20			
Roseland, La.	.25		1.00	1.00		
WESTERN:						
Grand Rapids, Wyo.	.50	.50	.85	.85	.80	.80
Kansas City, Mo.		(Kaw River sand, car lots, .75 per ton, Missouri River, .85)				
Niles, Calif.	1.00	1.00	1.40	1.00	1.00	1.00
Pueblo, Colo.	1.10•	1.00•			1.50•	
San Diego, Calif.	.80@1.00	.80@1.00	1.30@1.60	1.25@1.55	1.15@1.45	1.10@1.40
San Francisco, Calif.		1.00	1.00@1.20	.85@1.00	.85@1.00	.85@1.00
Seattle, Wash.	1.50•	1.50•	2.00•	1.50•		1.50•

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 inch down	Sand, ¼ inch and less	Gravel, ½ inch and less	Gravel, 1 inch and less	Gravel, 1½ inch and less	Gravel, 2 inch and less
Attica, Covington, Silverwood, Ind., and Palestine, Ill.	.75	.75	.75	.75	.75	.75
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Cape Girardeau, Mo.			River sand, 1.00 per yd.			
Cherokee, Ia.			.80 per ton—1.20 washed			
Detroit, Mich.	1.10•					
Dudley, Ky. (Crushed Sand)..		1.05		1.00		
Elkhart Lake, Wis.			Washed gravel .66			
Estelle Springs, Tenn.						.85
Fishers, N. Y.	.60	.65		.60		.50
Glenville, N. Y.				1.00•		
Hamilton, O.			6 in. and less, .20 per ton			
Hartford, Conn.		1.00•				
Hersey, Mich.				.60	.60	.60
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Janesville, Wis.		.65			.65@ .75	
Lindsay, Tex.		1.50				.60
Oxford, Mich.				.65	.65	
Pine Bluff, Ark.			Road gravel .60			
Rochester, N. Y.	.60@ .75	.60@ .75			.50@ .65	.50@ .65
Roseland, La.		.75				
Saginaw, Mich., f. o. b. cars		.75	1.30	1.30	1.30	1.30
St. Louis, Mo.			60% gravel, 40% sand, 1.50			
Summit Grove, Ind.	.65	.65	.65	.65	.65	.65
Waco, Texas		.80		1.50		1.30
Winona, Minn.	.70					
Yardville, N. J.		.50@ .75				
York, Pa.		1.10@1.20	(crushed rock sand)			

•Cubic yard. B Bank. L Lake. || Ballast.

Crushed Slag

City or shipping point	Roofing	¾ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:							
Buffalo, N. Y.	2.35	1.25	1.25	1.25	1.25	1.25	1.25
E. Canaan, Conn.	3.50	1.10	2.50	1.25	1.25	1.25	1.25
Eastern Pennsylvania and Northern New Jersey	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Erie, Pa.	2.35	1.25	1.25	1.25	1.25	1.25	1.25
Emporium, Pa.			1.25	1.25	1.25	1.25	1.25
Lebanon, Pa.	2.50	.85	1.50	.85	.85	.85	.85
Sharpsville and West Middlesex, Pa.	2.00	1.30	1.70	1.30	1.30	1.30	1.30
Western Pennsylvania	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Chicago, Ill.			All sizes, $1.50, F. O. B. Chicago				
Detroit, Mich.			All sizes, 1.65, F. O. B. Detroit				
Ironton, O.	2.40	1.75		Other grades 1.75			
Jackson, O.	2.00	1.35	1.70	1.35	1.35	1.35	1.35
Stuebenville, O.	2.00	1.40	1.70	1.40	1.40	1.40	1.40
Toledo, O.	2.93	2.30	2.49	2.49	2.49	2.30	2.30
Youngstown, Dover, Hubbard, Leetonia, Struthers, Steubenville, Lowellville & Canton, O.	2.00	1.30	1.70	1.30	1.30	1.30	1.30
SOUTHERN:							
Alabama City, Ala.	2.05	.80	1.00@1.25	1.15	1.05@1.10	.85@1.00	.85@ .90
Birmingham, Ala.	2.05	.80	1.25	1.15	1.10	.95	.85
Ensley, Ala.	2.05	.80	1.25	1.15	1.10	.95	.85
Longdale, Goshen, Glen Wilton & Low Moor, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.05

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing Hydrate	Masons' Hydrate	Agricultural Hydrate	Chemical Hydrate	Ground Burnt Lime Blk. Bags	Ground Burnt Lime Blk. Bbl.	Lump Lime Blk. Bbl.
EASTERN:							
Adams, Mass.						8.00	
Bellefonte, Pa.			11.50		8.00		
Berkley, R. I.			14.00				
Buffalo, N. Y.		11.00	11.00	11.00		9.50	2.00*
Chaumont, N. Y.					2.50	4.00	
Chippewa, Pa.					5.50		
Lewisburg, Pa.					7.50		
Lime Ridge, Pa.					5.75		
Mt. Union, Pa.					7.50		
Paxtang and Le Moyne					5.00		
Rockland, Maine						8.00	
Union Bridge, Md.			13.00		5.50		
West Rutland, Vt.						7.50	
West Stockbridge, Mass.			15.00				
Williams and Blue Bell, Pa.			11.25				
Williamsport, Pa.					10.00	10.00	6.00
York, Pa.		11.50	11.50	11.50		8.50	
CENTRAL:							
Alton and Hannibal, Ill.					11.50		
Delaware, Ohio			8.50				
Geneo, Ohio		10.50 (paper sacks)					
Gibsonburg, Ohio		10.50 (paper sacks)					
Huntington, Ind.	10.50	9.00	8.50			8.00	1.70*
Knowles and Valders, Wis.			12.50		5.00	9.00	
Marblehead, Ohio		9.00	8.50			8.00	1.70*
Mitchell, Ind.		12.00	12.00	12.00		9.00	1.75*
Sheboygan, Wis.					5.50	8.50	
White Rock, Ohio	10.50						
Woodville, Ohio (dealers' price)	10.50*	9.00*	8.50*	9.00*		8.00	1.70

*50 lb. bags. Terms. 30 days net; 25c per ton or 5c per bbl. discount for cash in 10 days from date of invoice.

SOUTHERN:							
Erin, Tenn.					7.00		
Knoxville, Tenn.	11.00	9.50	9.50			7.50	1.30
Staunton, Va.					7.50	8.75	
WESTERN:							
Colton, Calif.			15.00				
Kirtland, N. Mex.					12.00		
Los Angeles, Calif.			15.00‡				
San Francisco, Calif.			19.50				
Tehachapi, Calif.						13.00	2.00

‡100-lb. sacks; *180-lb. net, price per bbl.; †180-lb. net, non-returnable metal barrel.

Miscellaneous Sands

(Continued from preceding page)

Delaware, N. J.—Molding fine	2.00
Molding coarse	1.90
Brass Molding	2.15
Dresden, O.—Core and molding fine	1.25
Molding coarse	1.50
Brass molding	1.75
Dunbar, Pa.—Traction, damp	2.75
Traction, damp	2.75
Dundee and Chalfants, O.—Sand blast	3.00
Glass, core and traction	2.75
Molding fine and brass molding	2.25
Furnace lining	2.50
Molding coarse	2.00
Falls Creek, Pa.—Glass sand	2.50
Furnace lining, traction and molding coarse	2.00
Sand blast	3.50
Eau Claire, Wis.—Core	.75@1.25
Sand blast	3.00@4.25
Traction sand	.50
Franklin, Pa. and Utica, Pa.—Traction	2.50
Brass molding	2.25
Core	1.50@2.00
Molding fine	2.25
Molding coarse	2.00
Sand blast	5.00
Greenville, Ill.—Molding coarse	1.50@1.70
Howard, O.—Glass sand	3.00
Molding—Fine and coarse	1.75
Stone sawing	2.00
Core, roofing and brass molding	1.75@2.50
Sand blast, furnace lining and traction	2.50
Kansas City, Mo.—Missouri River core	.80
Kasota, Minn.—Molding coarse and stone sawing	1.65
Klondike and Gray Summit, Mo.—Molding fine	2.00@2.50
Molding coarse	2.50@3.00
Mapleton, Pa.—Core, furnace lining, molding coarse and brass molding	2.00@2.75
Molding fine	2.25@2.75
Roofing sand	2.00@3.00
Sand blast	1.50@2.00
Massillon, O.—Glass sand, molding fine and coarse, core, and furnace lining	3.00
Traction	3.00
Michigan City, Ind.—Core, glass, traction and brass molding	.30@ .40
Millington, Ill. — Glass, core, furnace lining, roofing and stone sawing	1.25@1.75
Mineral Ridge, O. — Core, molding, sand blast, roofing, etc., washed, screened (damp)	2.50
Montoursville, Pa.—Core	1.25@1.40
Traction	1.00
Brass molding	1.40
New Lexington, O.—Molding fine	2.25
Sand blast	3.00
Glass, core and traction	2.75
Furnace lining	2.50
Brass molding	2.25
Oregon, Ill.—Core and glass sand	2.00
Furnace lining	2.00
Molding fine and coarse	1.00
Sand blast	3.50
Ottawa, Ill.—Crude Silica sand	1.25
Core, molding, fine and coarse	1.25
Furnace lining	1.25
Roofing and traction	1.50

Miscellaneous Sands

(Continued)

Sand blast	3.00@4.00
Stone sawing	1.50
Traction	1.25
Ottawa, Minn.—Core	1.00@1.50
Glass, molding coarse, stone sawing (all crude silica)	1.00@1.50
Ridgeway, Pa.—Glass sand, green	2.25
Glass sand, wash	2.50
Molding, fine and coarse	1.20
Rockwood, Mich.—Core, damp	2.50
Roofing	3.00
Sand blast	3.50
San Francisco, Cal.—Glass and roofing	3.00@3.50
Core, molding fine and brass	2.30@2.60
Furnace lining and molding coarse	3.60@4.25
Coarse core sand	3.60@4.25
Sand blast	2.30@3.60
Stone sawing and traction	2.30
Thayer, Pa.—Traction	1.75
Furnace lining	1.00
Molding fine and coarse	1.00
Core—green	1.75
Utica, Ill.—Stone sawing, roofing	1.25@2.50
Furnace lining, core	.85@1.10
Molding, fine and coarse	.85
Traction	1.25
Sand blast	2.50
Williamstown Junction, N. J.—Glass sand	2.80@2.90
Core, wet	2.50@2.60
Zanesville, Ohio—Molding fine	1.45@1.75
Brass	1.50@1.75
Molding coarse	1.25@1.50
Furnace lining	2.50
Glass, core and traction	2.50
Sand blast and steel molding	2.50
Pulverized silica thru 140 mesh	8.50
Thru 200 mesh	9.50

Talc

Prices given are per ton f. o. b. (in carload lots only) producing plant, or nearest shipping point.

Baltimore, Md.—Crude talc	4.00
Cubes	45.00
Blanks, per lb.	.02
Biltmore, N. C., ground talc—150-200 mesh, bulk	20.00@25.00
Pencils and steel workers' crayons, per gross	1.15@ 2.50
Chatsworth, Ga.—Crude talc	8.00@10.00
Ground talc (150-200 mesh), bags	12.50
Pencils and steel workers' crayons, per gross	1.50@ 2.00
Chester, Vt. — Ground talc (150-200 mesh)	8.00@10.50
(Bags extra)	
Emeryville, N. Y.—150-200 mesh; bags	14.00
Glendale, Calif. — Ground talc (150-200-mesh	16.00@30.00
(Bags extra)	
Ground Talc (50-300 mesh)	13.50@15.50
Gouverneur, N. Y.—Crude talc	4.00
Hailsboro, N. Y.—Ground Talc (150-200 mesh)	15.00@20.00
Henry, Va.—Crude talc (lump mine run), per 2000-lb. ton	2.75@ 3.25
Ground talc (20-50 mesh), bags, 5.75@8.00; (200-350 mesh) bags	9.25@13.00
Johnson, Vt.—Ground talc (20-50 mesh), bulk	8.00
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@15.00
(Bags extra)	
Keeler, Calif.—Ground talc (200 mesh), bags	16.62
(Bags extra)	
Los Angeles, Calif.—No. 1 (150-200 mesh)	15.00@18.00
Ground talc, No. 2	20.00
Silver talc dust, 600 mesh	50.00
Natural Bridge, N. Y.—Ground talc (150-200 mesh) bags	12.00@15.00
Rochester and East Granville, Vt.—Ground talc (20-50 mesh), bulk	8.50@10.00
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@22.00
(Bags extra)	
Vermont—Ground talc (20-50 mesh); bags	8.00@10.00
Ground talc (150-200 mesh); bags	9.00@16.00
Waterbury, Vt.—Ground talc (20-50 mesh), bulk	8.50
(Bags extra)	
Ground talc (150-200 mesh), bulk	10.00@15.00
(Bags extra)	
Pencils and steel workers' crayons, per gross	1.20@ 2.00

Rock Phosphate

Raw Rock

Per 2240-lb. Ton

Centerville, Tenn—B.P.L. 72% to 75%	6.00@8.50
(Continued on next page)	
B.P.L. 65%	6.00
Gordonsburg, Tenn.—B.P.L. 68%@72%	5.00@6.50
Mt. Pleasant, Tenn. — Analysis, .75 B.P.L.	8.00@10.00
Montpelier, Idaho—70% B.P.L.—Crude	5.00
Crushed 2-in. ring and dried	6.00
Paris, Idaho.—2,000 lb. mine run, B.P.L. 70%	4.00
Wales, Tenn.—B.P.L. 70%	7.75

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Gray Roofing Slate, f.o.b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12	$ 9.30	$8.40	$8.10	$7.80
24x14	9.30	8.40	8.10	7.80
22x12	10.80	8.70	8.40	9.10
22x11	10.80	8.70	8.40	9.10
20x12	10.80	8.70	8.40	9.10
20x10	11.70	9.00	8.70	8.40
18x10	11.70	9.00	8.70	8.40
15x 9	11.70	9.00	8.70	8.40
16x10	11.70	8.40	8.40	8.10
16x 9	11.70	8.40	8.40	8.10
16x 8	11.70	8.40	8.40	8.10
18x12	11.10	8.70	8.40	8.10
16x12	11.10	8.70	8.40	8.10
14x10	11.10	8.40	8.10	7.80
14x 8	11.10	8.40	8.10	7.80
14x7 to 12x6	9.60	8.40	8.10	.....
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$7.50	$7.20	$5.75
22x11	8.40	7.80	7.50	5.75
Other sizes	8.70	8.10	8.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.
Granulated slate per net ton f. o. b. quarries, Vermont and New York, 7.50

(Continued from preceding page)

Ground Rock

	Per 2000-lb. Ton
Centerville, Tenn.—B.P.L. 70%—	
90% thru 100 mesh	9.00@10.00
B.P.L 75% (brown rock)	12.00
Mt. Pleasant, Tenn — B.P.L. 68%—	
13% Phosphorus	7.50@9.00
14% Phosphorus	8.00
B.P.L. 65@70%	7.00@9.00
Norwills, Fla.—(Fla. Hard Rock)—	
B.P.L. 68%	10.00

Florida Soft Phosphate

Raw Land Pebble

	Per Ton
Bartow and Norwills, Fla.—B.P.L.	
50%, bulk	6.00@ 8.00
B.P.L. 78%, bulk	13.50
Jacksonville (Fla.) District	10.00@12.00

Ground Land Pebble

	Per Ton
Jacksonville (Fla.) District	14.00
Add 2.50 for sacks.	
Morristown, Fla.—26% phos. acid	16.00
Lakeland, Fla.—B.P.L. 60%	6.00

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Bound Brook, N. J.—Trap rock, carload lots; bulk		2.30
Chicago, Ill.—Stucco chips, in sacks f.o.b quarries		17.50
Deerfield, Md. — Green; bulk	7.00	7.00
Easton, Pa.—Evergreen, creme green and royal green marble	8.00@10.00	12.00@14.00
Lincoln, Neb. — Red, white, grey, in bags		30.00
Middlebrook, Mo.—Red granite; sacks	30.00@35.00	20.00@25.00
Milwaukee, Wis.	21.00@30.00	21.00@30.00
Missouri river points — Different colors	20.00@25.00	20.00@25.00
Piqua, O.—Marble	8.00@10.00	8.00@10.00
Sioux Falls and Red Granite, Wis.	7.50	7.50
Tuckahoe, N. Y.—White marble	7.00@12.00	10.00
Crushed white stone and marble dust in 100 lb. bags	6.50@12.00	.....
Tate, Ga.—White limestone, sacks extra	5.00@ 7.00	5.00@ 7.00
Wausau, Wis.	14.00@18.00	.....
Wisconsin and S. Dak. points—Granite, different colors, bulk or sacks	1.50@ 2.00	3.00@ 7.00
Granite dust in bags	6.00	.....

Concrete Brick

Prices given per 1,000 brick, f. o. b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	20.00	30.00@45.00
Bellow Falls, Vt.	20.00	25.00
Birmingham, Ala.	16.00	27.50@50.00
Bridgeport, Conn.	31.00	32.00
Buffalo, Niagara Falls and Rochester, N. Y.	21.00	.....
Friesland, Wis.	25.00	.....
Houston, Tex.	18.50	21.50
Lockport, N. Y.	17.00	.....
Milwaukee, Wis.	17.00@18.00	35.00@65.00
Omaha, Nebr.	26.00	33.00
Piqua, O.	18.00	25.00@50.00
Portland, Ore.	25.00	45.00@75.00
Rapid City, S. D.	20.00	30.00@60.00
St. Paul, Minn.	15.00	32.00
Springfield, Ill.	18.00	20.00@25.00
Tonawanda, N. Y.	20.00	.....
Virden, Ill.	18.00	20.00@25.00
Winnipeg, Man., Can.	19.00	40.00

Sand-Lime Brick

Prices given per 1,000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Albany, Ga.	8.00
Barton, Wis.	10.00
Bloomfeld, Ont.	16.00
Boston, Mass.	15.00
Brighton, N. Y.	15.00
Buffalo, N. Y.	16.50
El Paso, Texas (Face 13.00)	14.00
Gary, Ind.	11.50@12.00
Grand Rapids, Mich.	13.00
Lancaster, N. Y.	13.50
Michigan City, Ind.	10.00
Miller, Ind.	10.00@10.50
Milwaukee, Wis. (delivered at job)	14.50
Minneapolis, Minn.	13.00
Plant City, Fla.	10.00
Portage, Wis.—Common	15.00
Face	25.00
Redfield, Mass.	15.00
San Antonio, Texas—Common	16.00
Face	27.50
South Dayton, Ohio	14.50
Syracuse, N. Y. (delivered at job)	20.00
F. o. b. cars	18.00
Toronto, Can.	15.00
Washington, D. C.	13.50
Winnipeg, Can. (less $1 trade disc.)	16.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrate per Ton	
	Finishing	Common
Atlanta, Ga.	19.00	16.00
Baltimore, Md.	15.00	13.00
Boston, Mass.	24.25	20.00
Cincinnati, Ohio	16.70	14.50
Chicago, Ill.	20.00	.....
Dallas, Tex.	25.00	.....
Denver, Colo.	30.00	16.00
Detroit, Mich.	15.75	13.75
Fort Dodge, Ia.	19.70	17.00
Genoa, Ohio	10.50	.....
Grand Rapids, Mich.	15.65	.....
Gypsum, Ohio	13.90	.....
Los Angeles, Calif.	.....	30.00
Minneapolis, Minn.	29.00	22.00
Montreal, Que.	21.00	.....
New Orleans, La.	.....	17.25
New York, N. Y.	16.99	.....
Oakfield, N. Y.	16.70	.....
Plasterco, Va.	19.80	.....
St. Louis, Mo.	24.00	20.00
San Francisco, Calif.	25.40	22.00
Seattle, Wash.	24.00	.....
	Lump per 180-lb. Barrel (net)	
	Finishing	Common
Atlanta, Ga.	2.00	1.60
Baltimore, Md.	.....	12.00
Boston, Mass.	3.40	3.10
Cincinnati, Ohio	.....	12.25
Chicago, Ill.	.....	1.65
Dallas, Tex.	.....	2.75
Denver, Colo.	2.95	.....
Detroit, Mich.	2.00	1.80
Los Angeles, Calif.	3.00*	3.00*
Minneapolis, Minn.	.....	1.50
Montreal, Que.	15.00†	.....
New Orleans, La.	.....	1.75
New York, N. Y.	.....	3.69*
St. Louis, Mo.	.....	1.65
San Francisco, Calif.	.....	2.25
Seattle, Wash.	3.50	2.75

*280-bbl. (net). †Per ton.

Portland Cement

Current prices per barrel in carload lots, f. o. b. cars, without bags.

Atlanta, Ga. (bags)	3.45
Baltimore, Md. (del.)	2.98
Birmingham, Ala.	2.85
Boston, Mass.	2.86
Cedar Rapids, Ia.	2.31
Cincinnati, Ohio	2.37
Cleveland, Ohio	2.28
Chicago, Ill.	1.97
Dallas, Tex.	2.80
Davenport, Ia.	2.27
Denver, Colo.	2.80
Detroit, Mich.	2.31
Duluth, Minn.	1.95
Indianapolis, Ind.	2.52
Kansas City, Mo.	2.75
Los Angeles, Calif.	3.31
Milwaukee, Wis.	2.19
Minneapolis, Minn.	2.26
Montreal, Que.	2.75
New Orleans, La.	3.20
New York, N. Y.	2.50
Pittsburgh, Pa.	2.02
St. Louis, Mo.	2.50
San Francisco, Calif.	2.84
St. Paul, Minn.	2.26
Toledo, Ohio	2.31
Seattle, Wash.	3.10
Winnipeg, Man. (del.)	3.86

NOTE—Add 40c per bbl. for bags.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco* Calcined Gypsum	Cement‡ Sand Gauging Plaster	Wood Fiber	White§ Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	Plaster Board ¼x32x36" Weight 1500 lbs. Per M Sq. Ft.	Plaster Board ⅜x32x36" Weight 2000 lbs. Per M Sq. Ft.	Wallboard, ⅜x32 or 48", Lengths 6'-10', 2000 lbs. Per M Sq. Ft.
Alabaster, Mich.	3.50	4.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Rapids, Kan.	3.50	4.50	7.50	9.00	11.00	11.50	11.00	.....	23.75	20.00	19.375	20.00	36.75
Centerville, Iowa	3.50	4.50	7.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Douglas, Ariz.	.....	.....	.....	.....	.....	11.00@12.00	.....	.....	.....	10.50@11.50	.....	.....	.....
†Eldorado, Okla.	.....	.....	.....	.....	11.00	11.50	.....	.....	15.50	.....	27.20	29.30	39.55
Fort Dodge, Ia.	3.50	4.50	7.50	9.00@11.00	11.00	11.50	16.45	.....	25.80	22.00	19.375	20.00	30.00
Grand Rapids, Mich.	3.50	4.50@8.50	9.50	9.00@12.00	12.00	12.00	19.50	.....	27.25	22.00	25.00	26.25	30.00
Gypsum, Ohio	3.50	4.50	7.50	9.00	11.00	11.00	20.25	8.00	27.95	20.00	19.375	20.00	30.00
Gypsumville, Man.	3.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hanover, Mont.	5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Loveland, Colo	3.50	4.50	7.50	9.00	11.00	11.50	.....	.....	29.80	.....	.....	.....	.....
Oakfield, N. Y.	3.50	4.50	7.50	9.00	11.00	11.00	21.20	7.50+	28.25	22.00	19.375	20.00	30.00
Piedmont, S. D.	.....	.....	7.50	9.00	11.00	11.50	.....	.....	32.25	.....	27.97	31.04	41.18
Plasterco, Va.	4.50	.....	7.00	9.00	11.00	11.00	21.90	.....	29.90	20.00	21.375	22.00	.....
Rapid City, S. D.	5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
†Southard, Okla.	3.50	4.50	7.50	9.00	11.00	11.50	11.00	.....	15.50	.....	26.20	28.70	39.40

NOTE—Returnable Jute Bags, 15c each, $3.00 per ton; Paper Bags, $1.00 per ton extra.
* Shipment in bulk 25c per ton less; †Acme, Tex., freight rates govern; ‡Bond Plaster $1.50 per ton additional; +Sanded Wood Fiber $2.50 per ton additional; §White Moulding 50c per ton additional.

General Market News

Construction to Begin Soon on New Southern Cement Plant

ACTUAL OPERATIONS for the erection of the plant for the Signal Mountain Portland Cement Co., one of Chattanooga's largest enterprises, will be started about October 1, according to plans announced Tuesday by Ralph Law, Secretary of the company, who returned recently from Cement City, Mich.

While in Cement City, Mr. Law held a conference with John L. Senior, president of the company, which resulted in the working out of a number of details with reference to starting the company's plant on a site already purchased near Glendale, on the Signal Mountain car line, only a few miles from the city.

It is thought by those interested that building materials and labor have about reached the low water mark. It is also the desire of the officers of the company to be able to get into the 1922 cement market, as all indications point to an unusual cement market for the next ten or fifteen years.

John L. Senior, president of the Signal Mountain Portland Cement Co., is now president of the Peninsular Cement Co., Cement City, Mich., and is a director of the Trinity Portland Cement Co., of Dallas, Texas, and is interested in other large cement companies.

It is expected that after October 1, either Mr. Senior or his representative will be on the ground continuously, and within a year Mr. Senior expects to make Chattanooga his home.

Mr. Senior has investigated within the last three years several locations for a cement plant in different parts of the country, and his associating himself with this company is proof that the Chattanooga location is superior from every standpoint.

Mr. Law stated that plans have not been completed and so no announcement of the size of the plant to be built or the cost can be made. The plant, however, is to be of the most modern design with a large capacity.

Marble Cliff Quarries Co. Wins Rate Case

REPARATION has been awarded by the Interstate Commerce Commission in No. 11199, Marble Cliff Quarries Co. vs. Director-General, as agent, and Pittsburgh, Cincinnati, Chicago & St. Louis, opinion No. 7117, 63 I. C. C., 339-41, on a finding that a switching rate of 30 cents per net ton on crushed stone between complainant's plants near Marble Cliff, O., during federal control, was unreasonable to the extent that it exceeded 20 cents, a subsequently established rate.

New York Cement Prices Take Sudden Drop

UTMOST CONSTERNATION greeted the announcement at the week-end to the effect that manufacturers have taken off thirty cents a barrel on the price of cement, according to the Dow Service Daily Building Reports.

Although there had been reason to suspect that some price change might occur before the first of the year the trade had not been expecting it so suddenly nor with so much precision. It became effective simultaneously with the issuance of the announcement, first by one company, the Atlas, and immediately followed by other cement manufacturers.

Within twelve hours from the time the announcement was mailed every cement producer selling in this market was quoting the price of cement at $2.50 net.

The dealers immediately followed suit with a reduction in price to their customers. Instead of the quoted price today being $3.00 to $3.20 a barrel, the dealers are delivering cement at $2.90.

The reason for the price cut at this time as given out by L. B. Burch, assistant to the president of the Atlas Portland Cement Co., John R. Morron, is contained in a statement which follows:

> Important savings have been made by the Atlas Portland Cement Company in the cost of manufacturing its product. It has passed the benefit of these savings on to its customers. These savings have been effected by greater efficiency among the mill employees resulting in lower costs of production. Coal and other raw materials are cheaper. The company has reduced its Northampton and Hudson base 25 cents a barrel and its Hudson lighterage rate has been lowered from 30 cents to 25 cents. This has made possible a drop in price to the trade from $2.80 to $2.50.

Various interpretations have been made of the cut and the market at the week-end was full of rumors. Its principal effect, however, has been to stir up a general revision of running contracts as purchasers for current requirements seek to exercise the clauses of sales agreements entitling them to any price benefit a fluctuating market might produce.

General unsettling of the construction market was not expected to result from the price change in cement. The policy dictating a cut in cement prices at this time of the year and in the light of present conditions of manufacture was generally accepted in the building material market as being one of expediency. Some of the biggest buyers freely stated that as the new cut narrowed manufacturers' margins almost to the vanishing point, a condition of stabilization might soon be expected as far as prices were concerned.

The prediction was made that by spring cement prices would rebound.

New Gypsum Plaster on the Market

UP TO ONE YEAR AGO but little advance had been made in the manufacture of gypsum wall plaster since 4,000 years ago when the Egyptians first used this material in their temples and pyramids. Other building materials have been improved for convenience, practicability or durability, but gypsum plaster remained fundamentally the same as when originated by the ancients.

After twelve months of complete test, however, the United States Gypsum Co. announces that the merits claimed for a new process of plaster manufacture have been proved completely. Great importance is attached to the success of this method by officials of the company, who point out that the new plaster overcomes difficulties that have been encountered by workmen and builders for thousands of years.

The plaster made by the new process is known as "Syanized Plaster." This process consists of sealing each minute particle of gypsum against atmospheric moisture. The plaster loses none of its sand-carrying capacity, even when stored for many months. It does not go "dead" while in storage, and, being always "fresh," assures full coverage. Other economies of this plaster are the rapidity with which it takes the water in mixing, and its unusual plasticity under the trowel.

I. C. C. Approves Freight Rate Cut on Sand, Gravel and Stone

THE INTERSTATE COMMERCE COMMISSION, Sept. 10, approved applications of carriers in eastern trunk-line territory for authority to make heavy reductions on five-days' notice in rates on sand, gravel and crushed stone applicable upon interstate traffic between practically all points in trunk line territory, including Pennsylvania, New Jersey, Delaware, Maryland and portions of West Virginia and Virginia. The new rates are to be published to become effective Oct. 1 and constitute material reductions under the rates now in effect. The basis to be employed in constructing the new rates is 15 per cent higher than the rates in effect prior to the general increase of August, 1920, thus substituting a 15 per cent increase for a 40 per cent increase.

A large volume of movement of these commodities for roads, buildings and other construction work will be affected and it is expected that the annual reduction in transportation charges will be much in excess of a million dollars.

News of All the Industry

Incorporations

John N. **Stephani**, East Patchogue, Long Island, N. Y., is constructing a concrete block factory.

P. C. **Allen, Nashville, Tenn.**, is contemplating the development of limestone deposits at Texarkana, Ark.

The **Associated Building Supply Co.**, Los Angeles, Calif., has been incorporated for $50,000 to deal in all kinds of building materials.

The **Penland Feldspar and Kaolin Co.**, Penland, N. C., has been incorporated for $25,000 by Harry, Charles R. and L. P. Bailey.

The **Connecticut Pink Quarries Co., Inc.**, East Lyme, Conn., has been incorporated for $50,000 by J. A. Hanninen, East Lyme, and others.

The **Wrightsville Stone and Lime Co.**, York, Penn., has been incorporated for $10,000 by Ralph D. Hoffman, York.

The **Empire Pulp Stone Co.**, Steubenville, Ohio, has been incorporated for $100,000 by Lee Van Tilburg and A. E. Rice.

The **Allyndale Lime Co.**, Southington, Conn., has been incorporated for $50,000 by Marie Cornish and others, all of Plantsville, Conn.

The **Superior Gravel and Sand Corporation** has been incorporated under the laws of Delaware by A. F. Danielson, 188 Montague St., Brooklyn, N. Y.

The **Alabama-Tennessee Lime Co.**, Hamilton County, Tenn., has been incorporated for $10,000 by E. Scott Miles, M. Kelly, C. N. Miles, Horace Hamby and C. A. Noone.

The **Travertine Products Corporation**, Livingston, Mont., has been incorporated for $500,000 to manufacture cement. C. V. Sackett and L. R. Nye, of Livingston, are interested.

The **Raleigh Concrete and Gravel Co.**, Shelby County, Tenn., has been incorporated for $10,000 by R. W. Barbee, Lee Prescott, John F. Barbee, D. B. Puryear and A. G. Riley.

The **Los Angeles Concrete Tile Co.**, Los Angeles, Calif., Monterey Park, has been incorporated for $75,000 to manufacture concrete products and deal in building materials.

The **Patton Cement Co.**, Rotan, Fisher County, Tex., has been incorporated for $350,000 by J. E. Durham, Dr. B. F. Reves, A. L. Foy, T. H. Mayfield, J. A. Waddell and W. B. Ferrel.

The **New Jersey Tile and Marble Co.**, Union Hill, N. J., has been incorporated for $125,000 by Fred Williams, 258 Cambridge Ave., Jersey City, N. J., Jacob Beyer, 340 Brown St., Union Hill, and Herman Beyer, North Bergen.

The **Renown Trading Corporation**, 320 Broadway, New York City, has been incorporated for $20,000 to engage in construction and quarrying. The incorporators are S. Goldstein, J. Wolvofsky, M. Wolberg, and the attorney, S. Salesen.

A. J. Cook & Co., Decatur St., Memphis, Tenn., building material dealers, report good activities in portland cement, sand and gravel. They are furnishing materials for some municipal work at Memphis and on a number of out-of-town jobs.

The **Ohio Flint and Glass Sand Co.**, Zanesville, Ohio, has been incorporated with $100,000 of preferred stock and 5000 shares of common stock of no par value. A. A. Flegel is president and Homer E. Walters, Peoples Savings Bank Bldg., Zanesville is attorney.

The **Florida Building Material Corporation**, Ocala, Fla., has been incorporated for $500,000. The purpose of the new company is to manufacture and produce building materials of all kinds, including the operation of quarries. The officers are: President, H. M. Hampton; vice-president, W. H. Cox; secretary and treasurer, J. P. Bater.

The **Nebraska Potash** plant at Antioch caught fire July 2. It is thought to have originated from sparks from a passing locomotive. The loss is estimated at $300,000, with about $50,000 of insurance. The fire lasted an hour and a half after it was discovered, and was extinguished by the city fire department and by the fire fighting equipment of the potash plant.

Quarries

The **Leathern D. Smith Stone Co.**, Sturgeon Bay, Wis., reports business in crushed stone and sand to be brisk.

The **Ingleside Limestone Co.**, Guernsey, Wyo., has resumed operations at its quarry.

The **Orcas Lime Co.**, 332 Pioneer Bldg., Seattle, Wash., is promoting the use of pulverized limestone for agricultural purposes.

The **Western Granite Co.**, Index, Wash., has reopened its quarries, and granite is being cut and polished at the plant.

The **State Highway Dept.**, Atlanta, Ga., has purchased a granite quarry in Elbert County, Ga. Annual output will be 250,000 tons.

The **Colorado Quarries Co.**, Salido, Colo., is now in possession of the Federal Granite Co. quarry, and extensive preparations for operation are under way.

The **Everett Mill and Lumber Co.**, Lompoc, Calif., is building a rock crushing plant. The stone is said to be an excellent grade of limestone.

The **Shelby County Farmers Co-op. Limestone Development Assn.** has been organized in Shelbyville, Ill., with a capital of $10,000 to put in a limestone crushing plant of daily capacity of ten tons.

The **Connecticut Valley Trap Rock Co.**, Springfield, Mass., has acquired the property of the Suffield-Berlin Trap Rock Co., West Suffield, Mass., which has been in financial difficulties for some time past. The project was inaugurated about three years ago, with an initial investment of close to $125,000, but was never very successful. The new owner is planning for the operation of the plant and, it is said, will commence work at an early date.

The **United Stone Products Co.**, Pittsburg, Kan., has completed a 200-ton per day crushing plant at Lehigh on the Joplin and Pittsburg Ry., where the company owns 80 acres of quarry property. The company will deal in all kinds of stone building material, including crushed rock, chat and sand. Business now in sight indicates the crusher can be kept busy at its capacity of 20 tons a day. The office of the new concern is in Room No. 316, Globe Building, with Earl Frazee as office manager. The organization will soon incorporate.

The **Hastings Stone Co.**, Hastings, Minn., is installing a battery of four new crushers at its quarry. There is also under construction a storage house for the crushed rock consisting of six bins with trackage running beneath which allows the cars to be filled automatically. In case of car shortage the surplus product will be stored in these bins until such time as cars can be secured, thus allowing the plant to be in continuous operation. This industry bids fair to be very remunerative as there will be an enormous demand for crushed rock when highway surfacing is in full swing, and this particular plant will be fully equipped to turn out this product to capacity.

Bedford, Ind.—With the co-operation of the Bedford Stone Club, and the Bedford Foundry and Machine Co., the board of education there has decided to add a course in vocational stone work to the high school curriculum. A set of stone working machinery will be installed in the new vocation stone room under construction at the building. The course has been approved by the state superintendent of industrial training.

A unique celebration was held in connection with the dedication of the new $350,000 mill of the Ingalls Stone Company at Bedford, Ind., recently, when the 400 local employes and their families were guests of the company at a Golden Rule jubilee honoring the establishment of the Golden Rule policy between employers and employes last April. Officials of the company, which operates the mill, the Robin Roost and McLaren mills and three large quarries, constituting one of the largest stone companies in the Bloomington district, said today that the Golden Rule policy had solved many difficulties and was directly responsible for the present prosperity of the company and employes. The program was held in the new building which replaces the mill destroyed by fire three years ago. Speakers were D. C. Ingalls, ex-mayor, Albert J. Fields, Evangelist Scoville, and the Rev. S. S. Lappin. Tables were set for 800 persons in the big building. A feature of the jubilee was the presentation by the employes of an American flag 28x40 feet, which will be hung in the big millroom.

Sand and Gravel

The **Lyman-Richey Sand Co., Fremont, Nebr.**, is pumping 8000 tons of sand per day. Electric-power dredges are used.

Lynchburg, Va., sand and gravel operators were unable to do business during the early part of September because the Rappahannock River level was unusually low.

The Shawneetown Sand and Gravel Co., Shawneetown, Ill., has raised its capital stock from $21,500 to $50,000 in order that new and better equipment may be secured. The demand for sand and gravel is several times larger than the company can supply with the present equipment, and if better machinery is acquired the demand will not keep the pumps and other machinery busy day and night. The company has had a splendid trade this season.

Cement

The **Dixie Portland Cement Co.**, Richard City, Tenn., reopened September 1 after a shut-down of a month.

The **Atlas Portland Cement Co.**, Hannibal, Mo., announced a 10 per cent reduction of wages, effective September 1.

The **Knickerbocker Portland Cement Co.**, Hudson, N. Y., was scheduled to resume operations on September 12, according to local reports. It was shut down for six weeks preceding.

The **Henry Cowell Lime and Cement Co.**, San Francisco, Calif., announced on Sept. 1 a cut in the price of portland cement of 25 cents per bbl., or from $4.69 to $4.44 in carload lots, San Francisco.

The **South Dakota State Cement Commission** will move its headquarters to Rapid City, S. D., where the new plant is contemplated. A. C. Hunt, of Rapid City, has been appointed a member of the commission.

The **International Portland Cement Co.**, New York City, will pay its usual quarterly dividend of 62½ cents a share on common stock and 1¾ per cent on preferred stock on September 30, to stockholders of record, September 24.

The **Olympic Portland Cement Co.**, Bellingham, Wash., is reported to have done a business of 60,000 bbls. in August. With the exception of one shipment of Hawaii all of the August output was used in Washington state highway construction.

The **New York and New England Cement Co.**, Hudson, N. Y., announced a 5 per cent cut in wages on Sept. 4. This is the third cut since the peak wages of 1920. The others were 25 and 2½ per cent, making the total cut to date 38½ per cent.

The **Universal Portland Cement Co.** announced a reduction in its selling prices for Universal portland cement, effective September 15, of 20 cents per barrel at its Chicago plant and 15 cents per barrel at its Pittsburgh and Duluth plants. This is the second price reduction made by this company this year.

The **Atlas Portland Cement Co.**, New York City, evidently has received a big order from the Cleveland, Cincinnati, Chicago and St. Louis R. R. (Big Four). The railroad company has applied to the Interstate Commerce Commission for authority to issue $300,000 of its one-year 5 per cent promissory notes to the Atlas Portland Cement Company.

Silica Sand

The **Clinch Mountain Silica Sand Co.**, Mendota, Va., has started operations. A quarry has been opened 4000 ft. up the mountain and rock is being conveyed to the crushing and grinding plant by an aerial cableway. Hydro-electric power from the company's own power plant is used for operation.

Personal

Earl F. Heimple, M. E., formerly chief engineer of the Edison Portland Cement Co., Stewartsville, N. J., has resigned to enter the sales force of the M. J. Dougherty Co., piping fabricators and engineers of Philadelphia. Mr. Heimple who is a graduate of Lehigh University has had a wide and varied experience in the engineering field and will be located in the home office.

Buyers' Bulletin

MANUFACTURERS OF MACHINERY AND EQUIPMENT:—These inquiries are live, up-to-date inquiries that have come direct to us from the individual in each case.

READERS OF "ROCK PRODUCTS":—This Department is for your special help and service. If you do not see what you require advertised in "Rock Products," tell us your needs and we will publish them here. There is no charge for this service.

L. E. Brooks, Box 22, Mill Creek, Okla., writes us as follows: "I wish to get descriptive circulars and catalogs of machinery, equipment and supplies for the handling of sand, gravel and crushed rock."

Walter S. Stewart, Mining Engineer, 504 E. 8th St., Salt Lake City, Utah, writes for information as follows: "I am designing a small "Slate Granule" crushing and screening plant, granules of 10 to 20 mesh to be used for surfacing asphalt roofing. I would be pleased to receive catalogs of small crushers and screens and to get in touch with engineers and contractors who have had experienee in the East with plants of the above type."

Geo. H. Myers, R. F. D. No. 1, Rockford, Ill., wants 6-in. rotary pump with which to pump sand and gravel out of river. Second hand preferred.

Thomas L. Davidson, Ripon, Wis., desires catalogs and prices on the following equipment; rock crusher, elevators (both bucket and belt) and screens. Wants to install a small sand and gravel plant.

V. H. Dougherty, Box 561, Harlan, Ky., wants catalogs on concrete brick, block and tile machinery.

Rand Mines, Ltd., P. O. Box 1169, Johannesburg, S. Africa, want the following catalogs: air compressors, wire rope, conveyor and transmission belting, sand-lime-brick machinery, clutches, compressors, pumps of all kinds, magnetic separators, drills, dust collecting systems, gas producers, hoists and gears.

The National Milling & Refining Co., 1244 Louisiana, N. W., Canton, Ohio, write us as follows: "We are in the market for air compressors, air drills, air and electric coal cutting machines, light rail, mine cars, mine scales, electric drills, electric generators, screens, etc., for coal mine operation, either new or used equipment. Kindly place us in quick touch with available equipment."

B. F. Marsh Co., 22 Garden St., Worcester, Mass., asks us. "Will you kindly advise as to different methods and apparatus for boring for making tests on our land to determine the quality and size of the deposits at depths down to twenty-five feet?"

Building Materials Co., care W. H. Pearce, Hamilton Apts., Norristown, Pa., wants catalogs on the following equipment: Transmission and conveyor belting, brick machinery, conveyors, elevating equipment, motor trucks, electric pumps, electric transformers and sand-lime-brick machinery.

Summit Lime Works, 803 6th Ave. S., Lethbridge, Alberta, Can., want information about machinery and methods used by cities for softening water with lime.

Raymond M. Glacken, Consulting and Manufacturing Chemist, 1520 Fidelity Bldg., Baltimore, Md., wants to get in touch with manufacturers of lime kilns and lime kiln equipment.

E. C. Taylor, Tinmouth, Vt., wants catalogs and data on the manufacture of concrete and sand-lime brick.

Charles Tolman, Mechanical Engineer, 64 Lafayette St., N. Y. City, is interested in obtaining information about the manufacture of sand-lime-brick.

A subscriber, the president of a large Middle West sand and gravel company, wants catalogs, cost data and detailed information about the manufacture of concrete building tile, blocks, brick, etc. Manufacturers of machinery for making these concrete products are requested to give information regarding names of buildings and locations using these methods, together with names of architects, contractors, etc., so the above subscriber can thoroughly canvas the business possibilities of the proposed products. Address Box No. 119, care ROCK PRODUCTS, 542 S. Dearborn St., Chicago, Ill.

240 h.p. B & W

WATERTUBE BOILER

140 lbs. allowance by Insurance Company and Public Service Commission for re-installation anywhere in New York State. 150 lbs. in any non-code state. Equipment includes shaker grates, present trimmings and new steel mud drum.

Attractive Price to Suit the Times

GENERAL EQUIPMENT CO.
Gridley Building Syracuse, N. Y.

SEVERAL BELT BARGAINS

98 ft. 24" 4-ply Rubber-Covered Conveyor Belting, slightly used.....$1.50 per foot
100 ft. 30" 8-ply Canvas-Stitched Belting, slightly used.....$1.62 per foot

NATIONAL BELTING AND SALVAGE CO.
268 East Water St., Milwaukee, Wisconsin

Large Crushers

JAW: 24x36-in. Farrel type 15B. 10x36-in. type 22B. Virginia delivery.

Gyratory: Two No. 6 Chalmers & Williams. New Jersey delivery.

All good condition. Do you want details on these or other sizes? Relaying rails in stock.

E. H. Wilson & Company
Commercial Trust Building
PHILADELPHIA

EQUIPMENT BARGAINS

3-ton Plymouth 4' 8½" ga. Gasoline Locomotive.
7x12 cyl. 36 in. gage Davenport Saddle Tank.
10—24 in. gage 1½-yd. Western Dump Cars.
15—36 in. gage 4 yd. Western Dump Cars.
3—16 yd. Western Air Dump Cars.
1—⅝ yd. Thew "O" Traction Shovel.

ZELNICKER IN ST. LOUIS
"Everything for the Quarry"

WANTED

Continuous pulverizing flint pebble mill for grinding feldspar. Give full description and lowest cash price.

CARL WILLMS, JR.
Miner and Pulverizer of Feldspar Erwin, Tenn.

FOR SALE

One Sauerman Slack Line Cableway, 1 yd. bucket, 75 h.p. Clyde two speed Electric Hoist, complete with tower, guy cables, track and loading cables. Used only one season. Now in operation and can be inspected.

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542 South Dearborn Street Chicago, Ill.

New—RAILS—Relaying

All sections on hand for quick shipment Reasonable prices quoted. Our stock is very complete.

M. K. FRANK
Frick Building Pittsburgh, Pa.

Used Equipment

Rates for advertising in the Used Equipment Department: $2.50 per column inch per insertion. Minimum charge, $2.50. Please send check with your order. These ads must be paid in advance of insertion.

Crushing and Grinding Machinery

8—Jaw Crushers—7x10 to 15x24.
8—Sets Cornish Rolls—up to 36"x14".
1—No. 5 Gates Gyratory Crusher.
1—No. 8 Gates Gyratory Crusher.
1—No. 3 Williams Crusher & Pulverizer.
2—No. 4 Williams Universal Mills.
1—4½' x 13" Hardinge Conical Pebble Mill.
1—No. 48 American Ring Pulverizer.
1—Braun's Laboratory Disc Pulverizer.

Power and Pumping Equipment

12—Steam Engines—6 to 200 HP.
6—Corliss Steam Engines—100 to 500 HP.
16—Vertical Steam Boilers—6 to 40 HP.
22—Horizontal Return Tubular Boilers—35 to 180 HP.
25—Oil, Gas & Gasoline Engines—2 to 800 HP.
18—Steam Hoists.
18—Centrifugal Pumps—1¼" to 10" Discharge.
28—Steam Pumps—1" to 14" Discharge.
15—Air Compressors—17 to 3000 Cu. Ft.

Write for Descriptive Stock List

The Machinery & Supply Corporation
JOPLIN, MISSOURI

New Rubber Belting

300 ft.	12" 6-ply	$0.99 per foot
423 ft.	14" 5-ply	1.04 per foot
527 ft.	14" 6-ply	1.25 per foot
529 ft.	16" 6-ply	1.39 per foot
520 ft.	16" 8-ply	1.90 per foot
150 ft.	18" 6-ply	1.48 per foot
512 ft.	18" 8-ply	2.00 per foot
216 ft.	24" 8-ply	3.15 per foot

Rolls Cut to Any Length

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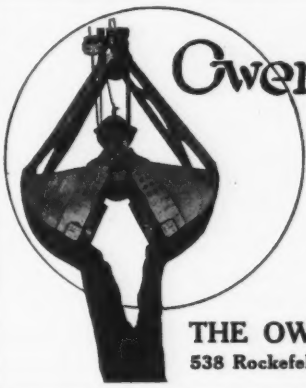

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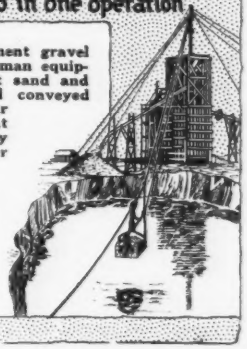

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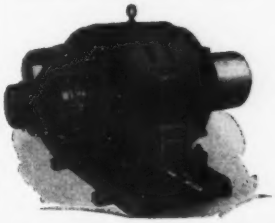

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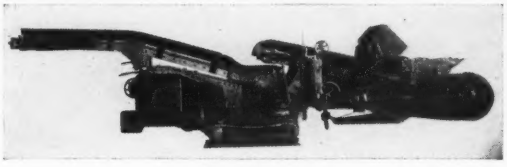

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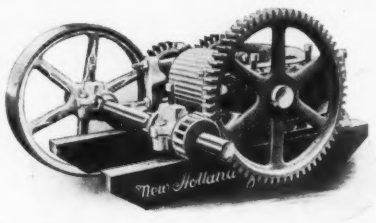

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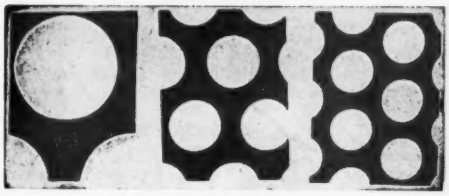

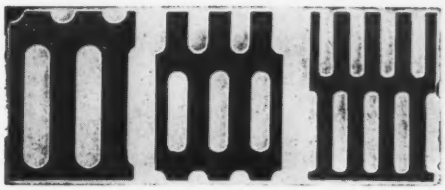

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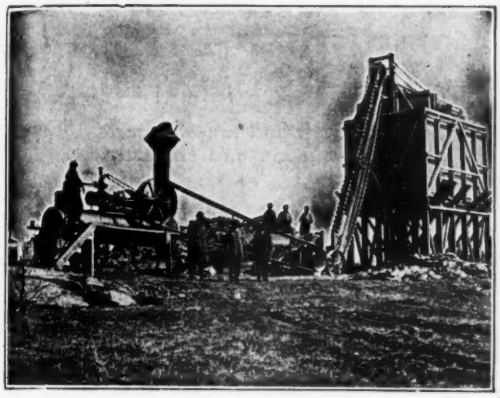

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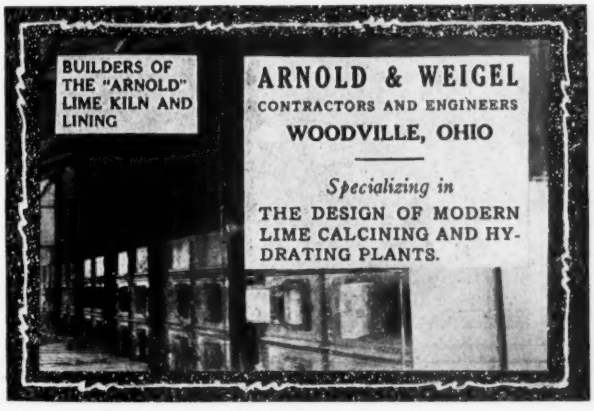
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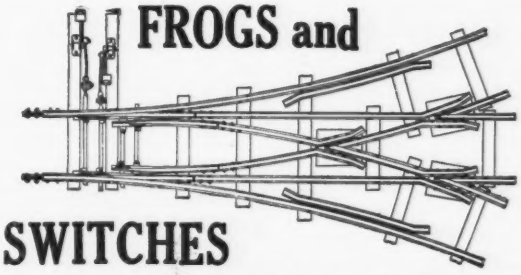

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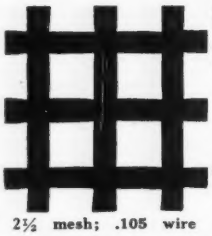

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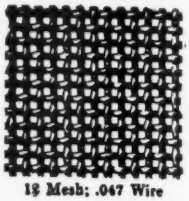

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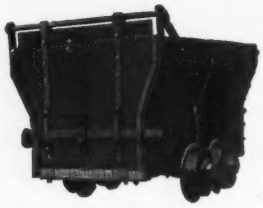

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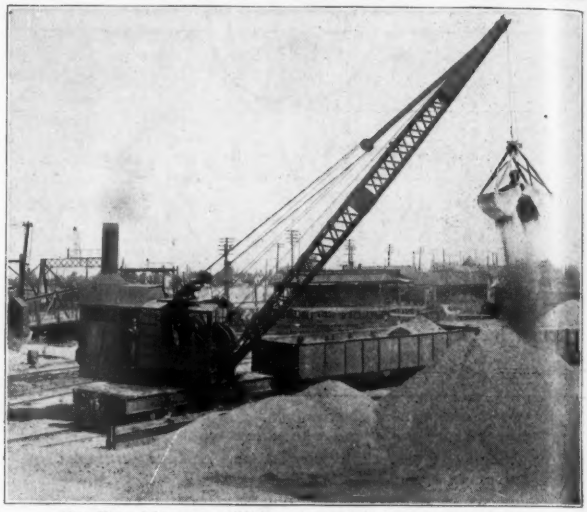

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Screening, Sizing, Air Separating, Mixing,
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Complete Units -:- -:- Engineering Service

STURTEVANT MILL CO., HARRISON SQUARE **BOSTON, MASS.**

GEAR AND FRICTION DRIVEN GASOLINE LOCOMOTIVES—2½ TO 25 TONS ON DRIVE WHEEL

WHITCOMB LOCOMOTIVES

IT WILL PAY YOU TO GET OUR PROPOSITION BEFORE YOU BUY

GEO. D. WHITCOMB CO.
MAIN OFFICE AND WORKS
ROCHELLE, ILLINOIS
U. S. A.

STORAGE BATTERY LOCOMOTIVES—1 TO 8 TONS ON DRIVE WHEELS

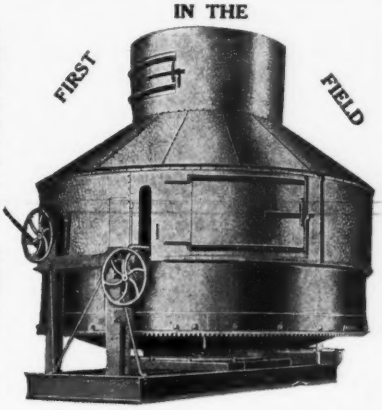
The Clyde Lime Hydrator Performance Counts

The Clyde was first in the field, and through dependable and economical performance is still first choice of lime operators.

The Clyde Hydrator produces big capacities of lime at only three-fifths the cost of any other hydrator on the market.

The Clyde not only produces over 90% of the hydrate of America, but makes the best quality of finishing lime from either high calcium or magnesium.

Simple, easiest to operate and most economical in cost of installing, maintaining, and operating.



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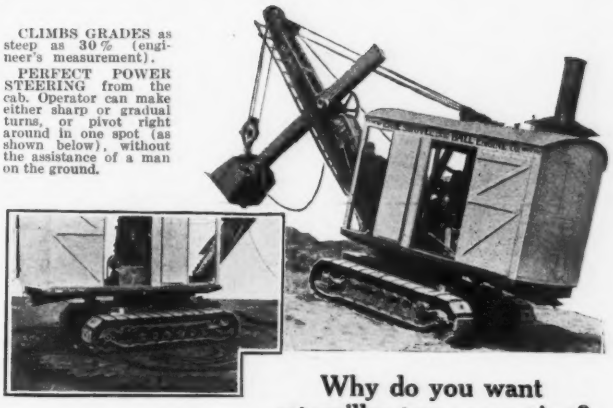
H. MISCAMPBELL
Patentee and Sole Manufacturer
DULUTH - - MINNESOTA

CLIMBS GRADES as steep as 30% (engineer's measurement).

PERFECT POWER STEERING from the cab. Operator can make either sharp or gradual turns, or pivot right around in one spot (as shown below), without the assistance of a man on the ground.



Why do you want caterpillar type mounting?

To make your move-ups easier and quicker, of course. You save the time needed to plank the shovel when traveling over rough or muddy soil. But you want a caterpillar type mounting that gives steady service month after month. The ERIE caterpillar type mounting is reliable and durable, because it is ***fully lubricated.*** And it has many other advantages over other continuous tread mountings you have seen.

We would like to send you complete information regarding the ERIE caterpillar type mounting. Just write for our new illustrated Bulletin P-60.

BALL ENGINE CO., Erie, Pa., U. S. A.
Builders of ERIE Steam Shovels and Locomotive Cranes

ERIE Revolving Shovels BALL

Cummings Gasoline Locomotives

are built to deliver maximum power and service at a minimum maintenance and operating expense.

Ruggedly constructed—all parts easily accessible—easy and comfortable to operate—all sizes friction disc driven—these are a few of the many reasons why CUMMINGS Gasoline Locomotives should be a part of your road building equipment.

Write for complete details

The Cummings Machine Co.
Minster, Ohio
General Sales Manager, Herbert Crapster
1 Madison Ave. New York, N. Y.

INTERNATIONAL BARRELS

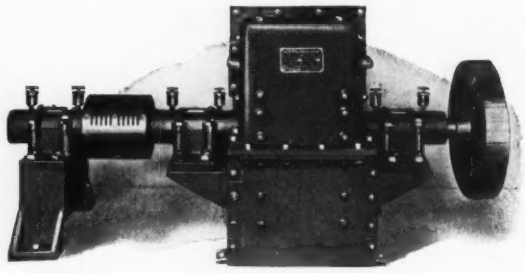
are without equal for quality, strength and durability

They are the best containers used in the Lime, Cement and Plaster Trades.

Our several branch shops permit quick deliveries of these QUALITY BARRELS to your plant, wherever it is located.

Samples and prices sent on request

International Cooperage Co., Inc.
Niagara Falls, N. Y.



By the very nature of the work it is called upon to perform a pulverizer must be much stronger than the material it handles.

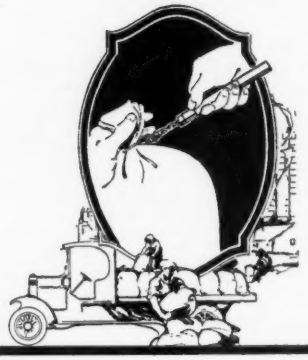
Only STEEL will stand the stress

"K-B" is built ALL-Steel

Catalog with full particulars on request

K-B PULVERIZER

K-B PULVERIZER COMPANY
Inc.
92 Lafayette St. NEW YORK



Try the Bates Bag Tying System on Your Work FREE

Not until you have tried the Bates system of wire tying, can you realize the many advantages of this modern superior method of bag tying.

The Bates tie is made quickly and uniformly perfect—**and it seals.** You can increase your volume of tied bags per day and do the work better and cheaper with the Bates System.

Send for this FREE Trial Bates Bag Tying Outfit

The Bates Free Trial Bag Tying Outfit, containing one Bates Spring Return Tying Tool and 20 each of 4, 4½, 5, 5½, and 6-inch Bates Wire Ties, will be sent you, on receipt of your signed agreement to try this Bag Tying Outfit on your work, and then, within 15 days, send **$2.50** for the outfit or return the tool to us. These ties cost you nothing.

BATES VALVE BAG COMPANY

7326 South Chicago Ave. Chicago, Ill.
110 Great Portland St. London, W. I., England

BATES SYSTEM FOR BAGS

METRO NITE

for Stucco-

Stucco Buildings, Concrete Blocks or Bricks faced with Metro-Nite are beautiful, artistic and everlasting.

Metro-Nite White is of a crystalline character, really a siliceous dolomite. It is extremely hard, sharp and cleanly graded, making a bright, sparkling face.

Free samples mailed on request.

Two colors—White and Green.

The Metro-Nite Co.
333 Hartford Ave., Milwaukee, Wis.

Among the Precious Stones—

GREENSTONE

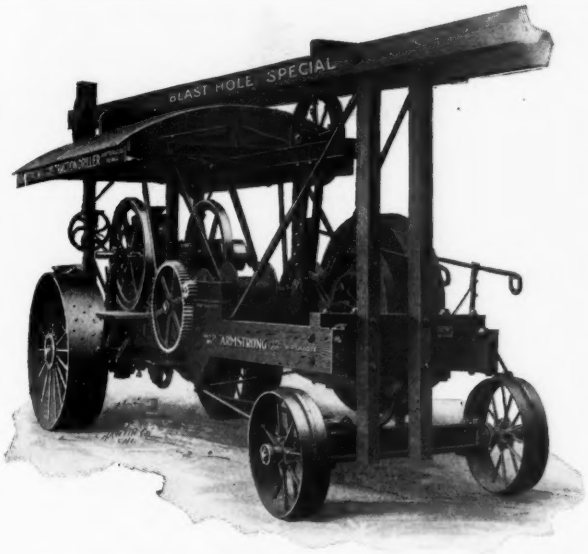
Is the one lasting ornament for surfacing Stucco. The natural olive-green color blends in harmony with Nature's color scheme, and age only tends to deepen the shade. The pure white back-ground of stucco, dashed with our No. 48 product, gives you a finish of unequalled beauty and durability.

Other Greenstone Products

Building Stone (Unfinished)
Commercial Stone
Greenstone Flour
Terrazzo Stone
Roofing Granules
Poultry Grit

Prices on Application

Greenstone Products Company, Inc.
Mills: Deerfield, Md. **Roanoke, Virginia**



The Armstrong is made in both Portable and Tractor types. It is simple, strong, durable. It lives up to the trade mark it bears:

Armstrong
BLAST HOLE DRILLS
BUILT FOR SERVICE SINCE 1867

It Is Performance That Counts

Quarry profits depend largely upon efficient work on the ledge. We could talk to you until dooms-day about the efficiency and simplicity of the Armstrong Blast Hole Drill and not exhaust the subject. But just now we'll let quarrymen do the talking.

Three 27-ft. Holes Per Day

"We have been using one of your Special Blast Hole Drills for two years in a 27-foot ledge of hard limestone and can easily complete three holes per day."
Hugh Murphy Construction Company.

440% Increase in Footage Drilled

"We have had one of your Special Blast Hole Drills in constant operation for the past three years and are well pleased. It is easily handled and readily moved from hole to hole. Our footage drilled per day was increased nearly 440% when we installed this outfit, replacing an older type of another make."
Mississippi Valley Iron Company.

Those are only two out of thousands of such letters that we have on file. If our Special Blast Hole Drill will do such work as that for others, it will do it for you.

The Armstrong, you know, holds the world's record of 386 ft. of 6-inch hole in solid rock in ten hours.

Get in line for more efficient work—for greater profits. Write us today for our catalog B-1.

ARMSTRONG MANFG. COMPANY
DEPT. A **WATERLOO, IOWA, U. S. A.**

BRANCH OFFICES:
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New York, 30 Church St.

SALES AGENTS:
H. N. Steinbarger Co., Denver
The Kaufman Co., Los Angeles
Collins Ferguson Co., Seattle, Portland
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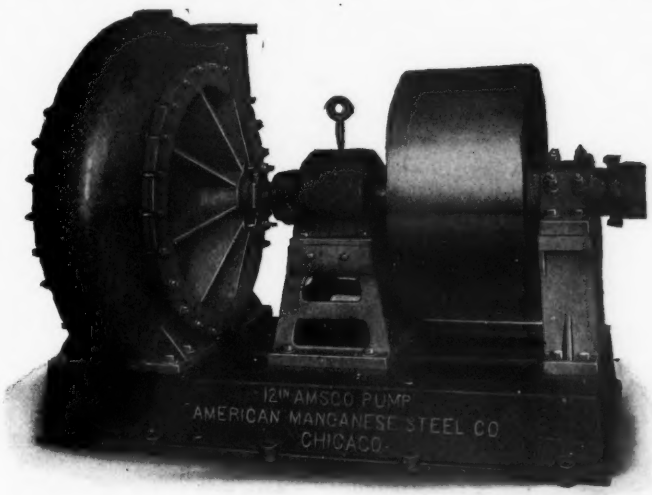
AMSCO SAND AND GRAVEL PUMPS



Are Dependable Producers

Save delays
More operating days
Lowest cost per yard pays

Built of rugged construction for hard service. Shell, side plates and runner—parts exposed to abrasive wear and constant grinding action—are made of manganese steel.

Extra heavy shaft, sturdy bearings, ball bearing thrust collar and well balanced runner, make the AMSCO pump a smooth-running and efficient machine.

AMSCO Flap Valves, Pipe and Elbows
Write for Pump Bulletin

American Manganese Steel Company

General Offices: 1872 McCormick Building, Chicago

Western Sales Office: Newhouse Bldg., Salt Lake City
Pacific Coast Office: Insurance Exchange Bldg., San Francisco, California
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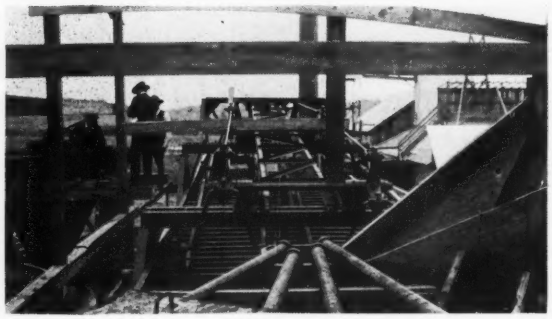
Foundries: Chicago Heights, Ill. — New Castle, Delaware — Oakland, California

DORR

Washing Phosphate Rock

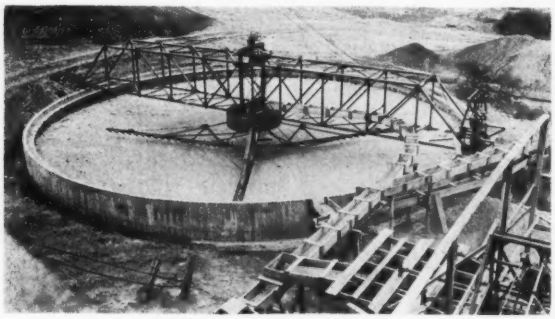
International Agricultural Corp'n
Wales, Tennessee



Two triple-deck Dorr Classifiers wash the rock free from clay and minus 100 mesh sand. The rake product from these Classifiers (about 100 tons per 24 hours) is dried and shipped.

An 80′ diameter Dorr Thickener receives the overflow from the Classifiers, consisting of from 2,000 to 4,000 gallons of water per minute containing from 75 to 100 tons of solids, and recovers the fine sand. The clay overflows the Thickener to waste.

Dorr Equipment can recover practically all the fine sand at *your* plant—continuously and with almost no cost for attendance or repairs. Let us tell you how.



The Dorr Company

Research Tests Denver
Engineers
101 Park Avenue
New York
Equipment Design
London, E. C. Mexico City

Lower Cost of Agricultural Lime

Williams Limestone Crushers cut the cost of producing agricultural or commercial crushed stone, because:

1st The hinged hammer principle, originated by Williams, is economical of power.

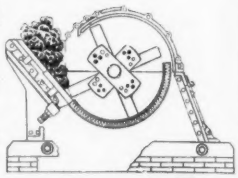
2nd The freedom from repairs, due to their super-strength, saves money and prevents shutdowns.

3rd The revolving-hammer grinding principle gives Williams mills enormous capacity.

4th They take larger stone. Even our smallest unit takes 60 lb. stone. Crushes to any size desired. With proper grates, Williams mills produce macadam four times as fast as fertilizer size.

Get the facts from users

Write for the names of co-operative agricultural lime producers, cement companies, quarries, or material dealers nearest you. No charge for preliminary plans.



WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY
Dept. 4 St. Louis, Mo.
67 Second St., San Francisco Calif.
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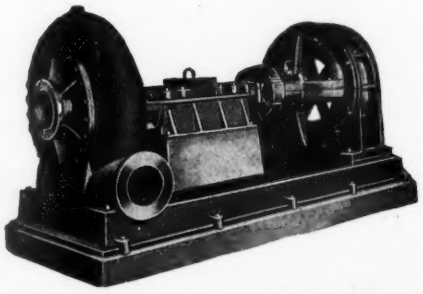
Williams
Patent Crushers – Grinders – Shredders



Heavy Service Dredging Pump

Where conditions are too severe for our standard sand pump, the above type is recommended.

It is built in sizes from 4″ up, arranged for belt, motor, or engine drive.

Morris Machine Works
Baldwinsville, N. Y.

39 Cortlandt Street, New York City
Real Estate Trust Bldg., Philadelphia, Pa.
217 N. Jefferson St., Chicago, Ill.

Bulletin No. 19-B fully describes our complete line of sand and dredging pumps. Have you your copy?

Morris

Since the Civil War Builders of Centrifugal Pumps, Hydraulic Dredges, and Steam Engines

In Buying Blast Hole Drills

DON'T buy the kind of machine that others have used and discarded!

DON'T buy a machine that the greatest Quarry Engineers of the country have condemned after severe scientific tests.

BUT—buy the Drill that takes the first place under all conditions!

☛ **BUY the "CLIPPER"! The most satisfactory Blast Hole Drill in the world!**

Visit the "Big" Quarries in the eastern half of the United States and **see what they use!**

Then write to us or come and see us and get information that will put you on the right track. Many big quarries are saving thousands of dollars annually because they took and are taking our advice about Blast Hole Drilling matters!

☛ **If you make a mistake** you have **nobody to blame but yourself.**

The Loomis Machine Company, Tiffin, Ohio

The Bright Sparks in Your Powdered Coal Flame Indicate Coarse Coal Which is Almost a Complete Loss to You

These sparks drop out of the flame as small particles of coke and although they increase the quantity of your clinker still the loss in heat units is a decided one during a year's time.

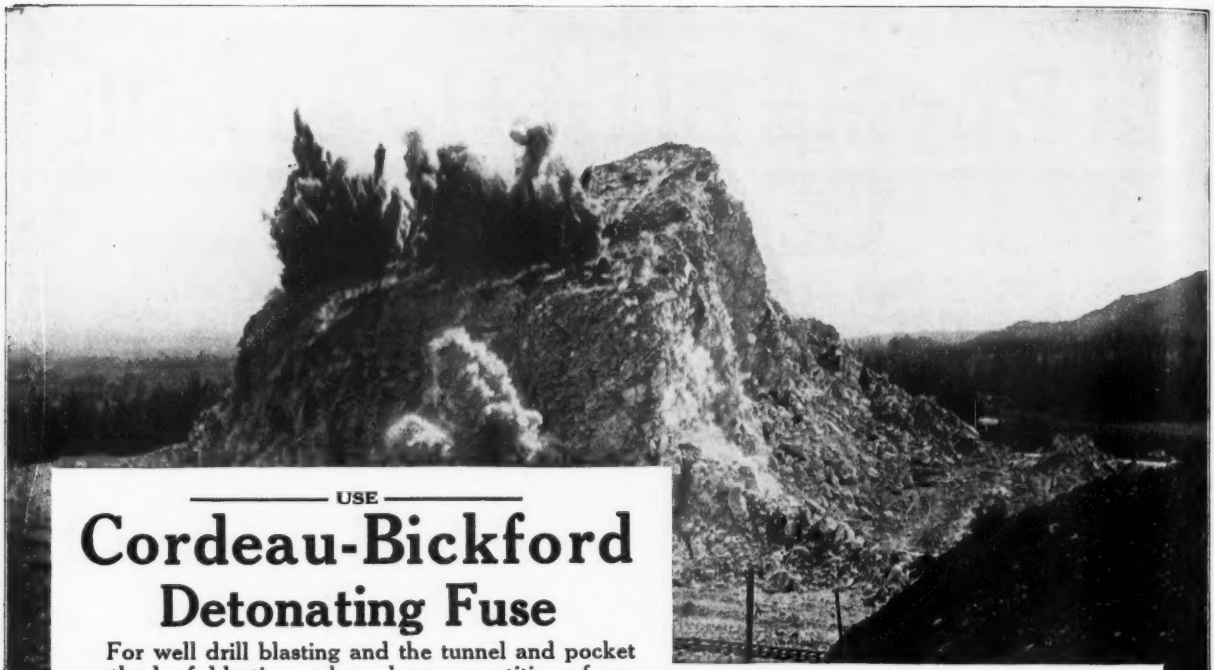
Those cement plants using Raymond Roller Mills find no bright sparks in the flame as the coal powdered on them is always fine and uniform. No coarse coal can get over because of the air separation. Coal ground to 95% passing a 100 mesh test sieve on a Raymond Roller Mill will show a fineness of all passing a 60 mesh indicating complete combustion the instant it is introduced into the kiln.

Raymond Bros. Impact Pulverizer Company

Western Office: 201 Boston Building Denver, Colo.

1301 No. Branch St. Chicago, Ill.

Eastern Office: 50 Church Street New York City



USE

Cordeau-Bickford
Detonating Fuse

For well drill blasting and the tunnel and pocket method of blasting, where large quantities of explosive are to be detonated, use safe, efficient Cordeau-Bickford and get lower blasting costs.

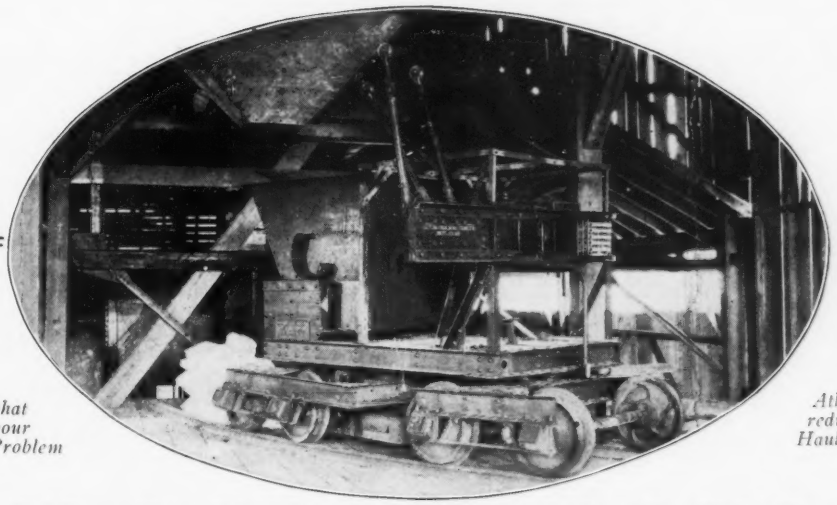
The Ensign-Bickford Co., Simsbury, Conn.
Established 1836 **Original Makers of Safety Fuse**

Schaffer Lime Plants can be built in small units embodying all the essential economical features of our large plants. Owing to freight conditions and the necessity for localizing certain operations, the

Schaffer Engineering & Equipment Co.

are in a position to offer a real service in connection with the design and installation of lime plants of either large or small capacity. The matter of economy in operation, whether in large or small units, will be paramount for the next several years. Also the necessity of quality as evidenced by Schaffer Engineering and Equipment Company plants is equally important.

Schaffer Engineering & Equipment Co.
2828 Smallman Street **PITTSBURGH, PA.**



Cars that meet your Haulage Problem

Atlas Cars reduce your Haulage Costs

End Dump Motor Driven Car at International Agricultural Co., Wales, Tenn.

This car has a capacity of 3 tons or 56 cu. ft. with self-dumping type body which rolls over automatically and discharges the load when unlatched. After discharge the body rights itself.

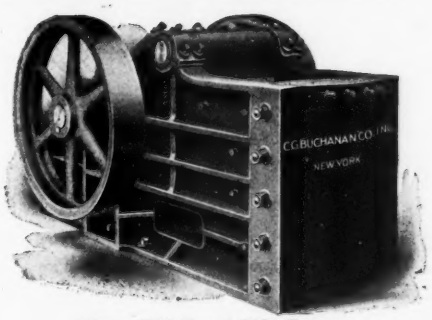
Equipped with A. C. motor—any type motor can be furnished.

Provided with double trucks to permit passing around short radius curves. These cars have been built with four wheels where curves are not so short.

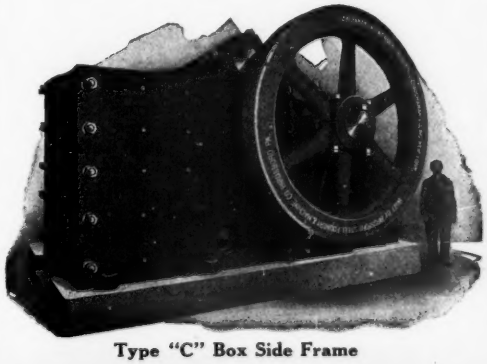
"Let Us Solve Your Haulage Problems"

THE ATLAS CAR AND MANUFACTURING CO.

ENGINEERS **CLEVELAND, OHIO, U. S. A.** **MANUFACTURERS**



Type "C" Panel Side Frame



Type "C" Box Side Frame

BUCHANAN JAW CRUSHERS
ALL STEEL PATENTED

Your Size in Stock

We have it here on our floor—just the size you need to meet your crushing requirements. And you will find the Buchanan a rugged crusher—all steel construction—with the ability to do the hardest kind of work at low cost.

Let us help you arrive at the best size and type of Buchanan Crusher for your work—36 sizes, from 66 in. by 84 in. to 5 in. by 12 in.

C. G. BUCHANAN CO., Inc.

Cedar and West Sts. **New York**

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Classified Directory of Advertisers in Rock Products

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Valve Bag Co. of America
Toledo, Ohio.

Belting

Cincinnati Rubber Mfg. Co.
Cincinnati, Ohio.
New York Belting & Packing Co.
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Blasting Supplies

Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio.

Brick Machinery

Shope Brick Co.
Portland, Ore.

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Hendrick Mfg. Co.
Carbondale, Pa.
Orton & Steinbrenner
Chicago, Ill.

Buckets

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Brown Hoisting Mach. Co.
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McMyler Interstate Co.
Cleveland, Ohio.
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Butterworth & Lowe
Grand Rapids, Mich.

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Austin Mfg. Co.
Chicago, Ill.
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Buchanan Co., Inc., C. G.
New York, N. Y.
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Chicago Heights, Ill.
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Pittsburgh, Pa.

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Erie, Pa.
Owen Bucket Co.
Cleveland, Ohio.

Excavators—Dragline Cableway

Link Belt Co.
Chicago, Ill.
Sauerman Bros.
Chicago, Ill.

(Continued on Page 64)

"SACO-FOUR"

—MOTOR-DRIVEN HOIST

The "Saco-Four" motor driven hoist is a compact, powerful unit mounted securely on a cast iron base. It can be easily moved and quickly secured to the floor or to a foundation. One operating lever engages the power or applies the brake. There are three operating positions of the control lever—power, neutral and brake. The brake is always locked in engagement unless held in the power or neutral position by the operating man.

Rope pull.....1,000 pounds
Rope speed.....150 ft. per minute
Horse power.....5

FEATURES

All parts easily accessible; cut spur reduction gears; wide face paper and iron friction gears; single operating lever; powerful contracting band brake; motor furnished for alternating or direct current.

WRITE FOR PRICES

STEPHENS-ADAMSON MFG. COMPANY
AURORA ILLINOIS

THE AUTOMATIC AERIAL TRAMWAY

LOWERS PRODUCTION COSTS

LET US DEMONSTRATE

INTERSTATE EQUIPMENT CORP.
25 CHURCH ST., NEW YORK

(Continued from Page 62)

Explosives
Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio.

Fuses
Ensign-Bickford Co.
Simsbury, Conn.

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Worcester, Mass.

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Milwaukee, Wis.

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Lewistown, Pa.

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The Kramer Bros. Fdy. Co.
Dayton, Ohio.

Grinding Mills
Munson Mill Machinery Co.
Utica, N. Y.

Hoists
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Cleveland, Ohio
Flory Mfg. Co., S.
Bangor, Pa.
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Lansing, Mich.
Vulcan Iron Works
Wilkes-Barre, Pa.

Hose—Water, Steam, Air Drill, Pneumatic Tool
Cincinnati Rubber Mfg. Co.
Cincinnati, O.
N. Y. Belting & Packing Co.
New York, N. Y.

Hydrating Machinery
Atlas Car & Mfg. Co.
Cleveland, Ohio
Kritzer Co., The
Chicago, Ill.
Miscampbell, H.
Duluth, Minn.
Schaffer Eng. & Equip. Co.
Pittsburgh, Pa.
Toepfer & Sons Co., W.
Milwaukee, Wis.

Hydraulic Dredges
Morris Machine Works
Baldwinsville, N. Y.

Lime Barrels
International Cooperage Co.
Niagara Falls, N. Y.

Lime Kilns
Arnold & Weigel
Woodville, Ohio
Glamorgan Pipe & Fdy. Co.
Lynchburg, Va.
Steacy-Schmidt Mfg. Co.
York, Pa.
Vulcan Iron Works
Wilkes-Barre, Pa.

Loaders and Unloaders
Ball Engine Co.
Erie, Pa.
Jeffrey Mfg. Co., The
Columbus, Ohio

Locomotives
Baldwin Locomotive Works, The
Philadelphia, Pa.
Cummings Mach. Co.
Minster, Ohio.
Fate-Root-Heath Co.
Plymouth, Ohio
Hadfield-Penfield Steel Co.
Bucyrus, Ohio
Jeffrey Mfg. Co., The
Columbus, Ohio
Lima Locomotive Works
New York, N. Y.
Porter Co., H. K.
Pittsburgh, Pa.
Vulcan Iron Works
Wilkes-Barre, Pa.
Whitcomb Co., Geo. D.
Rochelle, Ill.

Motors
Sorgel Electric Co.
Milwaukee, Wis.

Motor Trucks
Pierce-Arrow Motor Car Co.
Buffalo, N. Y.
Traylor Eng. & Mfg. Co.
Allentown, Pa.

Packing—Sheet, Piston, Superheat, Hydraulic
Cincinnati Rubber & Mfg. Co.
Cincinnati, Ohio
N. Y. Belting & Packing Co.
New York, N. Y.

Paint and Coatings
Williams, C. K., & Co.
Easton Pa.

Perforated Metals
Chicago Perforating Co.
Chicago, Ill.
Cross Eng. Co.
Carbondale, Pa.
Harrington & King Perf. Co.
Chicago, Ill.
Hendrick Mfg. Co.
Carbondale, Pa.

Pinions
Tool Steel Gear & Pinion Co.
Cincinnati, Ohio.

Pipe Joints
Berry Flexible Pipe Joint Co.
Philadelphia, Pa.

Plaster Machinery
Butterworth & Lowe
Grand Rapids, Mich.
Ehrsam & Sons Co., J. B.
Enterprise, Kan.

Portable Conveyors
Stephens-Adamson Mfg. Co.
Aurora, Ill.

Pumps
Allis-Chalmers Mfg. Co.
Milwaukee, Wis.
American Manganese Steel Co.
Chicago Heights, Ill.
Kansas City Hay Press & Tractor Co.
Kansas City, Mo.
Morris Machine Works
Baldwinsville, N. Y.

Power Transmitting Machinery
Caldwell H. W., & Son Co.
Chicago, Ill.

Powder
Du Pont de Nemours & Co., E. I.
Wilmington, Del.
Grasselli Powder Co.
Cleveland, Ohio

Pulverized Fuel Equipment
Fuller-Lehigh Co.
Fullerton, Pa.
Raymond Bros. Impact Pulv. Co.
Chicago, Ill.

Pump Valves
N. Y. Belting & Packing Co.
New York, N. Y.

Quarry Equipment
Universal Road Mach. Co.
Kingston, N. Y.

Rope, Wire
American Steel & Wire Co.
Chicago, Ill.
Leschen, A. & Sons Co.
St. Louis, Mo.

Scrapers, Drag
Sauerman Bros.
Chicago, Ill.

Screens
Cross Eng. Co.
Carbondale, Pa.
Diamond Mfg. Co.
Wyoming, Pa.
Hendrick Mfg. Co.
Carbondale, Pa.
Jeffrey Mfg. Co., The
Columbus, Ohio
Link Belt Co.
Chicago, Ill.
Smith Eng. Works
Milwaukee, Wis.
Stephens-Adamson Mfg. Co.
Aurora, Ill.
Stimpson Equip. Co.
Salt Lake City, Utah
Sturtevant Mill Co.
Boston, Mass.
Tyler Co., The W. S.
Cleveland, Ohio
Universal Road Mach Co.
Kingston, N. Y.

Separators
Rubert M. Gay Co.
New York City.
Raymond Bros. Impact Pulv. Co.
Chicago, Ill.
Sturtevant Mill Co.
Boston, Mass.
Tyler Co., The W. S.
Cleveland, Ohio

Separators, Magnetic
Buchanan Co., C. G., Inc.
New York, N. Y.

Shovels—Steam and Electric
Ball Engine Co.
Erie Pa.
Bucyrus Co.
S. Milwaukee, Wis.
Osgood Co., The
Marion, Ohio

Shoveling Machines
Myers-Whaley Co.
Knoxville, Tenn.

Stucco Facings
Crown Point Spar Co., Inc.
New York City.
Greenstone Products Co.
Roanoke, Va.
The Metro-Nite Co.
333 Hartford Ave. Milwaukee, Wis

Switches and Frogs
Central Frog & Switch Co.
Cincinnati, Ohio
Easton Car & Constr. Co.
Easton, Pa.

Tanks, Steel Storage
The Blaw-Knox Co.
Pittsburgh, Pa.
Pittsburgh-Des Moines Steel Co.
Pittsburgh, Pa.
The Stacey Bros. Gas Constr. Co.
Cincinnati, O.

Testing Sieves and Testing Sieve Shakers
Tyler Co., The W. S.
Cleveland, Ohio

Tramways
Interstate Equip. Co.
New York, N. Y.

Trolleys
Brown Hoisting Mach. Co.
Cleveland, Ohio

Washers, Sand and Gravel
Link Belt Co.
Chicago, Ill.
Smith Eng. Works
Milwaukee, Wis.

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Easton, Pa.

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American Steel & Wire Co.
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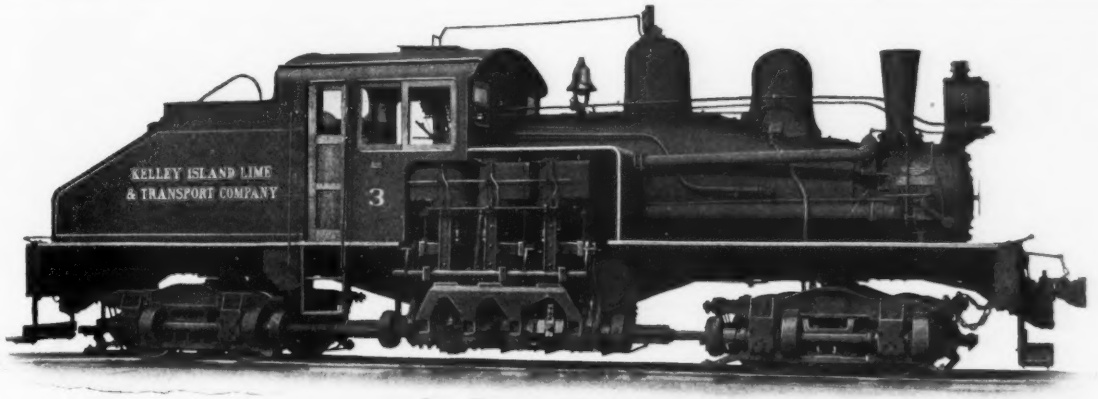
Leschen, A., & Sons Co.
St. Louis, Mo.

Wire Cloth
Cleveland Wire Cloth Co.
Cleveland, Ohio
Tyler Co. The W. S.
Cleveland, Ohio



You'll Need Shays

Street and road building contracts are beginning to show a gratifying improvement. Contract totals are greatly higher than those for corresponding months of 1920.

Busy times are ahead for the quarrymen, times when every minute will mean dollars.

For getting out rock and gravel, you can't get a better engine than the Shay Geared Locomotive.

There are no driving wheels to slip and stall, no jerks to break car couplings and delay production. The Shay starts smoothly, powerfully, and accelerates with an ease and speed that saves many a minute in spotting.

Shays will help you to make the most of the busy period.

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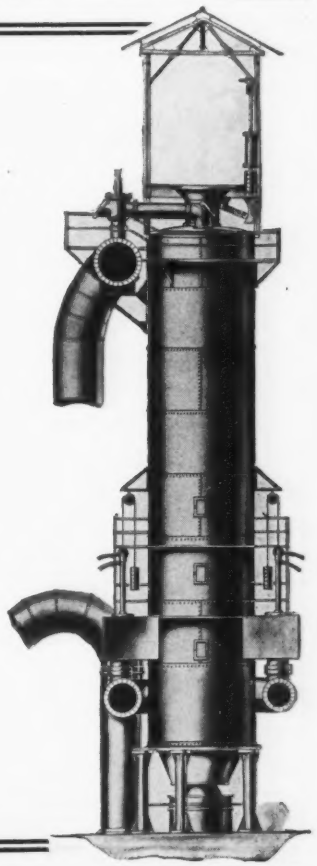
Lima, Ohio 17 East 42nd St., New York

Continuous Discharge—Gas Fired

LIME KILNS

The wastefulness or efficiency of any lime burning apparatus is determined by the amount of fuel per ton of lime produced.

Our Kilns are not an experiment, but have successfully met the test of years of actual service. The design is the work of our Consulting Mechanical and Chemical Engineer, who has had many years of practical operative experience. They embody a number of labor saving devices, and are designed to secure maximum production with minimum fuel consumption; their record in this respect should interest every lime producer in the country.



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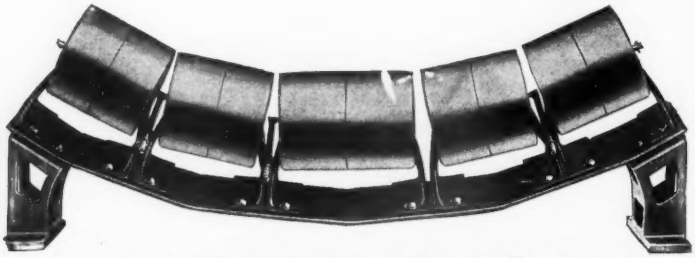
Lynchburg, Va., U. S. A.

Using the Nationally Famous Virginia Foundry Irons

STEARNS MATERIAL HANDLING METHODS



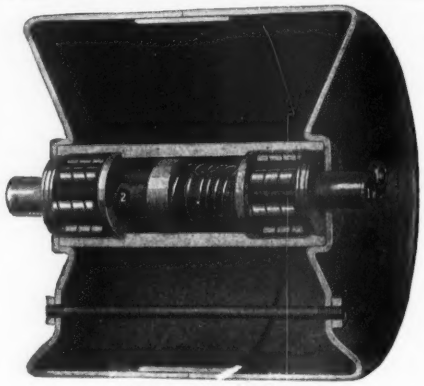
STEARNS MATERIAL HANDLING METHODS

Stearns Gradual Troughing Type Belt Conveyor Idler with Alemite Lubricating Plugs

In the inclined Idler Pulley of the Stearns Belt Conveyor a spring plunger forces the grease to the upper bearing.

It is not necessary to take pulley apart or the bearings out to lubricate.

A few turns of the Alemite Grease Gun fills the grease reservoir with sufficient lubricant to last from six months to a year.



Single Idler Pulley

Grease from the Alemite Gun enters the Idler Pulley at 1, passes thru 2, filling grease reservoir and pressing back plunger.

The lubricant moves from the center out. It thus seals the bearings from dirt and grit which ordinarily enters.

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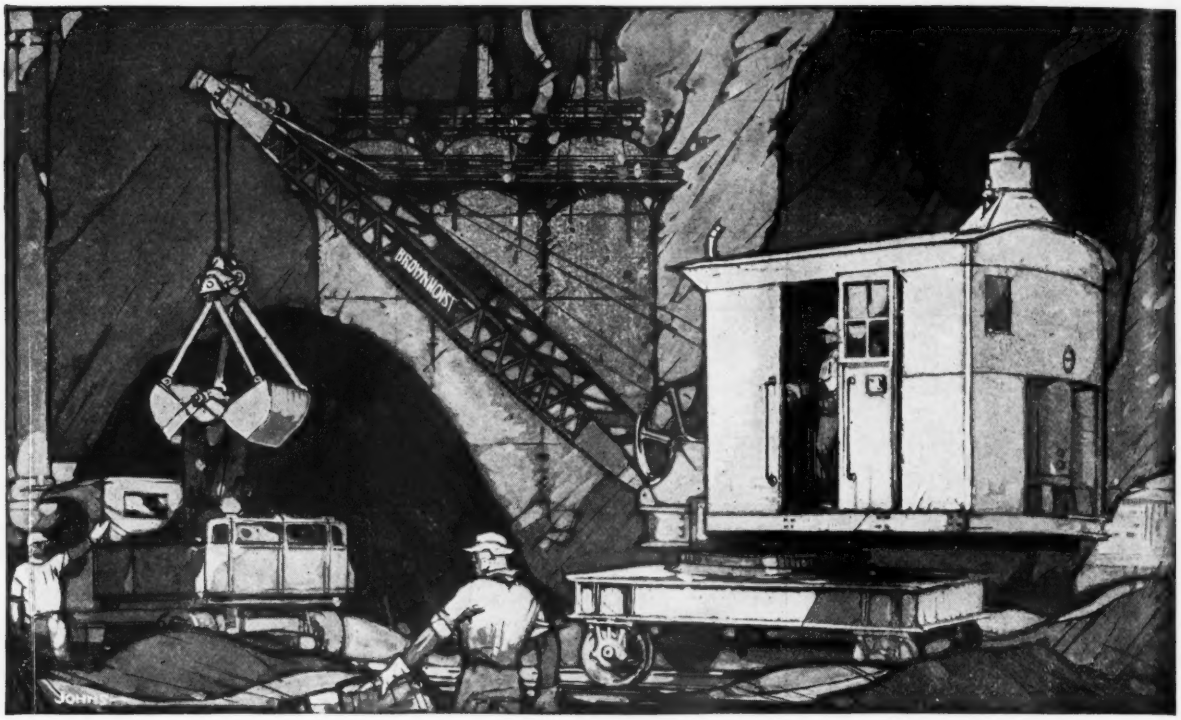

Brownhoist No. 2 Locomotive Crane with extra equipment of 30-foot Boom and Clamshell Bucket

A Capable Locomotive Crane That Costs Only $6,500

Now, when lowest production costs are so necessary, our No. 2 Crane offers executives a ready means of reducing material handling expense.

This No. 2 Brownhoist costs less than $15 a day—cost of operation, interest, depreciation, tax, repairs and all other expense included. Figure the saving as against man power.

A Brownhoist—efficient, economical, sturdy—can be profitably employed in most industrial plants. Are you eager to cut corners in material handling costs? Then send for our catalog K-21, which shows how a Brownhoist Crane cuts costs.

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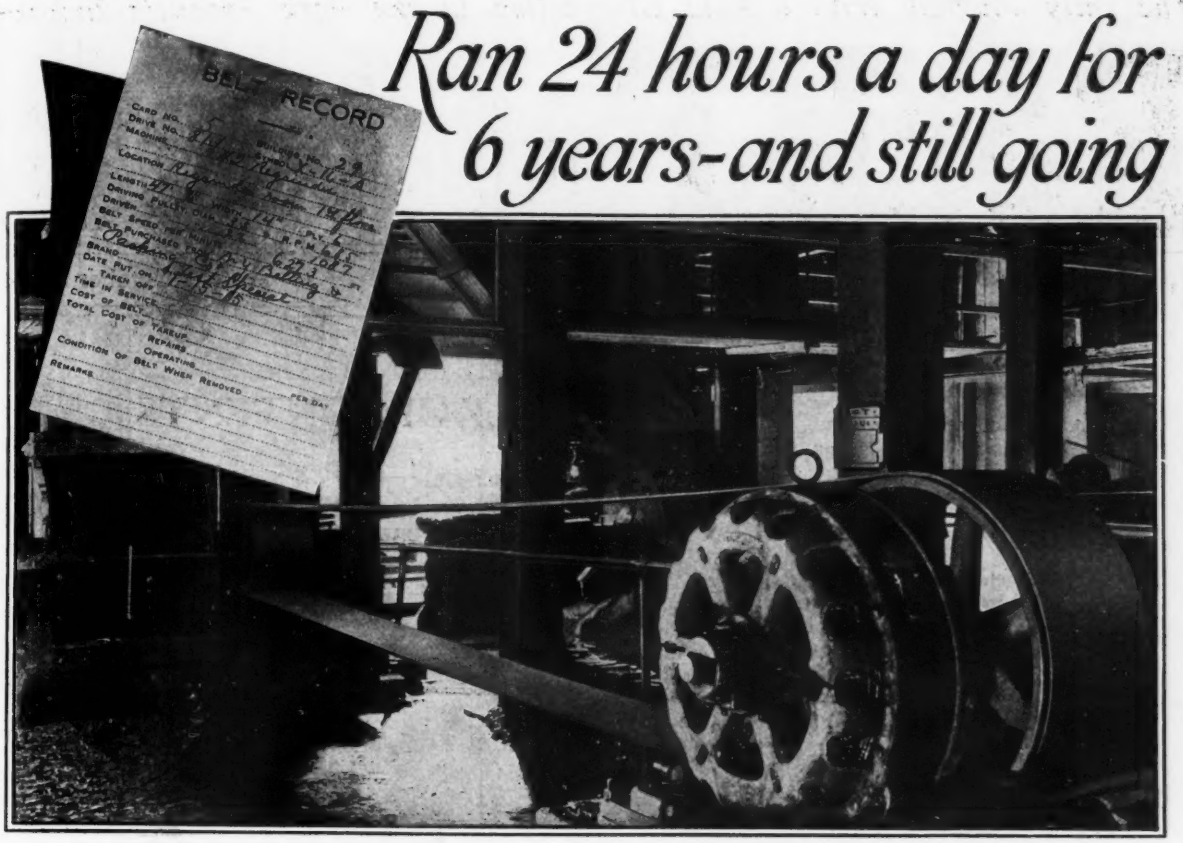
Ran 24 hours a day for 6 years-and still going



The photograph shows a TEST SPECIAL Rubber Belt on Regrinding Machine at the mill of Champion Fibre Co., Canton, N. C.

DELIVERING power at more than a mile a minute belt speed for six years is the remarkable record of this TEST SPECIAL Rubber Belt. Notwithstanding the severe duty of working 24 hours a day at such an excessive rate, the belt is in excellent condition and good for many years' service.

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—stretch is practically eliminated.
—by the nature of the materials used in the construction of TEST SPECIAL Rubber Belting, cotton duck and rubber, it is thoroughly waterproof, naturally non-slipping and flexible.

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